Information Circular 9035

Principal Deposits of Strategic and Critical Minerals in Nevada

By N. T. Lowe, Russell G. Raney, and John R. Norberg

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald Paul Hodel, Secretary

BUREAU OF MINES
Robert C. Horton, Director

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

cm	centimeter
g	gram
g/t	gram per metric ton
gal/min	gallon per minute
gal/ton	gallon per short ton
ha	hectare
kg	kilogram
kg/t	kilogram per metric ton
km	kilometer
km^2	square kilometer
kV	kilovolt
kW	kilowatt
kW·h	kilowatt hour
L/s	liter per second
L/t	liter per metric ton
lb	pound
MW	megawatt
m	meter
m^2	square meter
m^3	cubic meter
m^3/d	cubic meter per day
m^3/h	cubic meter per hour
mi^2	square mile
oz	ounce
ppm	parts per million
t	metric ton
t/a	metric ton per year
t/d	metric ton per day
t/h	metric ton per hour
t/month	metric ton per month
t/wk	metric ton per week
ton	short ton
ton/h	short ton per hour
ton/yr	short ton per year
tr oz	troy ounce
tr oz/ton	troy ounce per short ton
wt %	weight percent
yd^3	cubic yard
yd^3/a	cubic yard per year
yd^3/d	cubic yard per day
yd^3/h	cubic yard per hour
yr	year

PRINCIPAL DEPOSITS OF STRATEGIC AND CRITICAL MINERALS IN NEVADA

By N. T. Lowe,[1] Russell G. Raney,[2] and John R. Norberg[3]

ABSTRACT

This Bureau of Mines publication presents salient deposit information in abstract form on 119 principal mineral deposits in the State of Nevada. Commodity coverage addresses 17 critical and strategic commodities that appear to have commercial production potential in the State. The core of the deposits described is taken from those properties evaluated under the Bureau of Mines Minerals Availability Program (MAP); additional deposits are included to provide a more complete coverage. Institutional and infrastructural factors affecting mineral development are also discussed.

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[1] Physical scientist.
[2] Geologist.
[3] Supervisory physical scientist.
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INTRODUCTION

About a decade ago, the Bureau of Mines embarked upon an ambitious program to systematically assess mineral supplies available to the U.S. economy. The Minerals Availability Program (MAP), formally established in 1974 (*727*),[4] provides current appraisals of nonfuel mineral supplies for consideration in the development of U.S. minerals policies. Results of these appraisals are published on a commodity basis in a series of availability reports that describe the supply of a commodity from domestic or foreign sources in terms of tonnage-price relationships.

The keystones of MAP appraisals are deposit-specific evaluations conducted by geologists and engineers of the Bureau's Field Operations Centers and by contractors. The deposit evaluations examine in detail the geologic, engineering, and economic factors that determine the viability of individual deposits. Deposit data are obtained from many sources, including published and unpublished Bureau reports, records, and files; U.S. Geological Survey (USGS) Bulletins, Professional Papers, and other reports; technical and professional journals; State and other Federal agency publications; proprietary company reports; data generated during field examinations; and information obtained from knowledgeable individuals.

The Bureau's purpose in publishing this prototype report is to present, in a single volume, nonproprietary data on 119 selected principal deposits of strategic and critical minerals in the State of Nevada. The easy-to-read format provides locational, geological, and operational data for selected deposits along with discussions of institutional and infrastructural factors affecting mineral development in the State.

Much of the deposit-specific data were derived from MAP deposit evaluations that have been conducted over the past 10 yr. Additional deposit data, as well as information on transportation, water, electricity, natural gas, and taxes were gathered from recent newspapers and journals and from interviews with company and State officials. Data on mineral production and mining history were obtained from Bureau and Nevada Bureau of Mines publications. It is anticipated that the information contained in this publication will be of benefit to geologists, mining engineers, prospectors, mining companies, suppliers of mining and milling equipment, and others directly involved in the State's mineral industry. It is also anticipated that the data will be equally as valuable to city, county, and State planners, transportation and utilities commissions, local tax advisory boards, and other public and private organizations that develop policies affecting mining and mineral development in Nevada.

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Special gratitude is extended to the entire staff of the Nevada Bureau of Mines and Geology. Particular thanks is given to J. H. Schilling, director; K. Papke, assistant director; H. F. Bonham, Jr., geologist; and J. Tingley, mining geologist, for their assistance in selecting the deposits included in this report, as well as providing supplemental deposit data.

ORGANIZATION OF REPORT

This publication is organized into two principal sections: an introductory statewide section followed by a site-specific deposit section.

The introductory section presents background information on the minerals industry of Nevada, a description of some existing infrastructure-institutional factors that affect commercial development of Nevada's mineral deposits, and a commodity review.

The infrastructure subsection contains brief discussions and maps of the transportation (highway and railroad) and utility (electricity, natural gas, and water) networks in the State. It also contains general information on milling or beneficiation facilities, and permitting and taxation procedures and policies with respect to mineral development in Nevada.

The commodity review consists of narrative, tabular, and map data that are intended to give a statewide overview of principal commodities associated with the deposits described. In addition to a brief narrative, each review contains data abstracted from the Bureau's Minerals Industry Location System (MILS). Production data were obtained from the Bureau's Minerals Yearbooks and Mineral Commodity Summaries, and from other published or publicly available sources (*728-729*). The reviews also include a listing of selected principal deposits in the State. (Most of the principal deposits are described in greater detail in the deposit abstract section.) The reserve-resource estimates are from published sources and, where necessary, have been converted to the International System of Units (SI) equivalents for ease of comparison. The column headed "Size" reflects the authors' professional judgment of the total resource contained in the deposit. The terms "small," "medium," and "large" are based primarily on the size categories published by the USGS (*236*); definitions of the terms are provided for each commodity. The associated location map shows the principal deposits along with other occurrences of the commodity.

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[4] Italic numbers in parentheses refer to items in the list of references preceding the appendexes.

The largest section of the publication is the deposit abstract section. It is composed of a series of single-page summaries of information pertaining to 119 selected mineral properties in Nevada. The summaries or abstracts are arranged alphabetically by the property's primary name. They are intended to report deposit information available through 1984; undoubtedly, the status, ownership, and some other data may have changed during the period between manuscript completion and report publication.

Each abstract is composed of the following six main subject areas:

1. Deposit name and commodity.
2. Location and ownership.
3. Geology.
4. Development.
5. Published reserves and/or resources.
6. References.

Within each subject area there are several individual data elements. Not all data elements, however, are reported for each deposit; proprietary data have been omitted and some information has yet to be determined or is not presently available. SI measurements are used throughout the deposit abstracts except for published reserves and/or resources. Reserve-resource data are reported in terms and units of the cited publication. (It is incumbent upon the reader to evaluate the reserve-resource data in the light of his or her own knowledge, experience, and assessment of the source's credibility.) In contrast, published reserve-resource data in the commodity reviews have been converted by the authors into SI measurements for comparison purposes. The reference section includes bibliographic references for the deposit, the USGS 1:250,000 quadrangle and largest scale map on which the deposit is located, and the Bureau's file reference or sequence number. The sequence number is a 10-digit number that is unique to the deposit and allows rapid retrieval of relevant data from the MAP data base. Two other file references, the Mine Safety and Health Administration (MSHA) number (Mid number), which is assigned by MSHA to active properties, and the USGS Mineral Resources Data System (MRDS), are also included. The MRDS is the former USGS Computerized Resources Information Bank (CRIB).

An extensive, but not exhaustive, reference section follows the deposit abstracts. The intent of the reference section is to provide the reader with additional sources of information about the deposits described in the main body of the report. Although an individual reference may not specifically mention the deposit, the reference contains geological, mining, metallurgical, economic, or other data pertinent to the deposit.

COMMODITY AND DEPOSIT SELECTION

This publication is in a sense a directory of principal strategic and critical mineral deposits in the State of Nevada. Deposit and commodity coverage mainly reflects the Bureau's work conducted under MAP. The MAP is concerned with a continuing assessment of the geologic, engineering, and economic availability of mineral supplies for the U.S. economy. Although the Bureau's ultimate objective is to incorporate all nonfuel mineral commodities into MAP, current MAP studies cover only the following strategic or critical commodities:

Aluminum
Antimony
Asbestos
Barite
Beryllium
Chromium
Cobalt
Columbium-Tantalum
Copper
Fluorspar
Gold
Graphite
Iron
Lead
Lithium
Magnesium
Manganese
Mercury
Molybdenum
Nickel
Phosphate
Platinum
Potash
Rare Earths
Silver
Sulfur
Tin
Titanium
Thorium
Tungsten
Zinc
Zirconium-Hafnium

All of these commodities, with exception of hafnium, reportedly occur in Nevada. Based on current knowledge, however, only those commodities in italics appear to have potential commercial production opportunities; this publication focuses on deposits whose principal commodity is one of the 17 commodities so indicated.

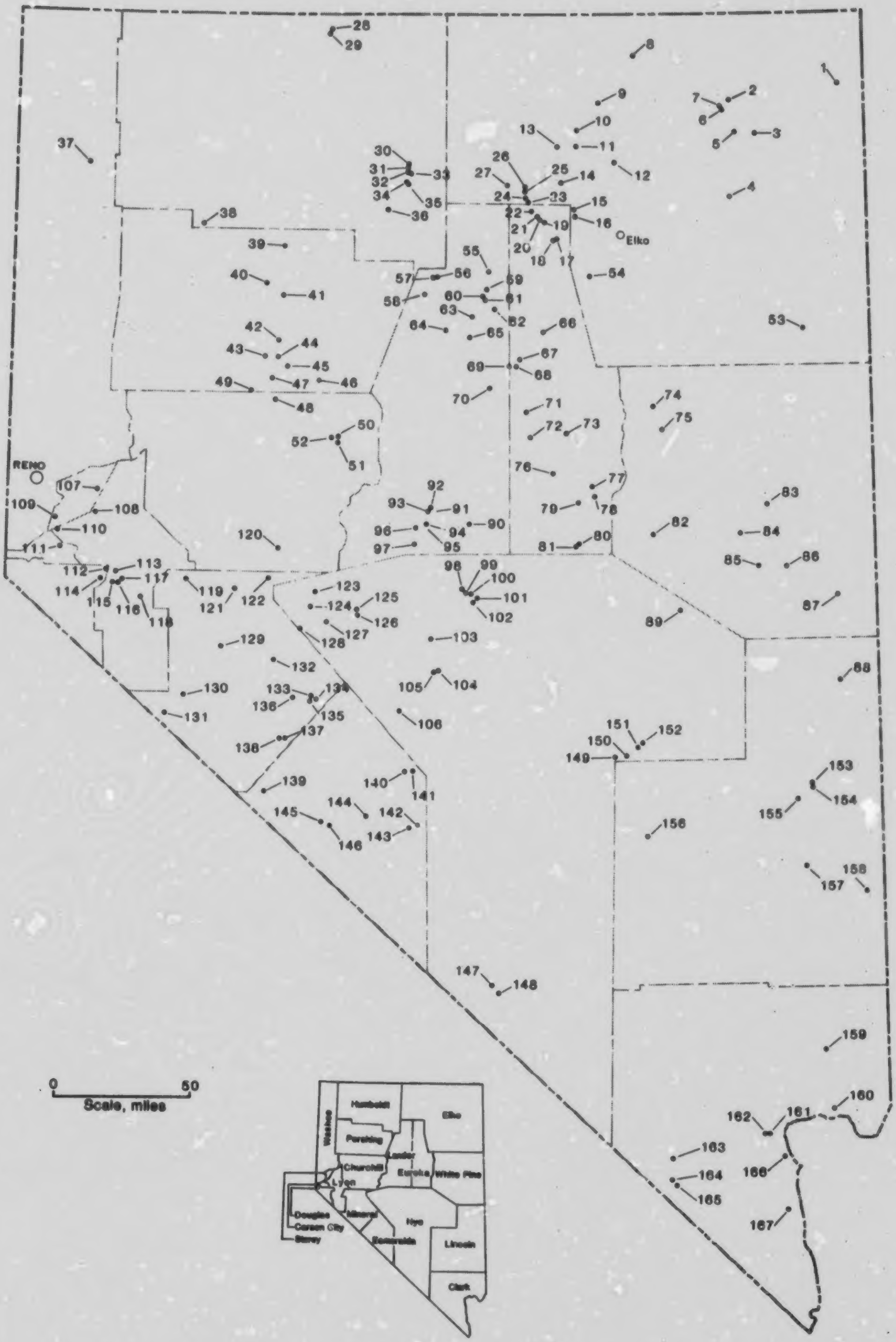
Under MAP, the Bureau has evaluated nearly 100 deposits in Nevada. Most were found to have identified reserves or resources; it is these deposits that form the core of the deposit abstract section in this report. Descriptions of other properties that appear to have commercial potential and which have yet to be evaluated under MAP, are also included to provide a more complete commodity coverage.

Final deposit selection was made after consultation with individuals and agencies familiar with the Nevada mining industry. In addition to hosting one of the commodities listed (as a principal commodity), deposit selection was based on one or more of the following criteria:

1. The deposit has been evaluated under MAP.
2. Information on substantial reserves or resources has been published for the deposit.
3. The deposit is a producing or past producing mine with known production potential.
4. The deposit is a nonproducing property with a known production potential based on proprietary and/or public exploration and economic data.
5. Sufficient nonproprietary geological and operational data exist to permit completion of a deposit abstract.

Figure 1 and table 1 show the locations and names of the 167 principal deposits selected for this report; deposit abstracts have been prepared for 119 of the principal deposits.

Table 2 shows the distribution (by commodity) of principal deposits and properties with deposit abstracts for each county.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Lander
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White Pine
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Figure 1.—Location of selected principal deposits in Nevada.

Table 1. — Selected principal deposit index

(Refer to figure 1)

Map No.	Deposit name	(1)
1..	Indian Springs[2]	W
2..	Jungle[2]	$BaSO_4$
3..	Easy Miner[2]	$BaSO_4$
4..	Wells	W
5..	Snoose[2]	$BaSO_4$
6..	Big Ledge[2]	$BaSO_4$
7..	Stormy Creek[2]	$BaSO_4$
8..	Garnet-Tennessee Mountain[2].	W
9..	Mesona	Au
10.	Enfield Bell[2]	Au
11.	Gance Creek	Au
12.	Q-Bar	$BaSO_4$
13.	Dexter	Au
14.	Lakes[2]	$BaSO_4$
15.	Fish Creek[2]	$BaSO_4$
16.	Heavy Spar[2]	$BaSO_4$
17.	Gold Quarry[2]	Au
18.	Maggie Creek[2]	Au
19.	Carlin[2]	Au
20.	Bullion Monarch[2]	Au
21.	Blue Star[2]	Au
22.	Goldstrike[2]	Au
23.	Bootstrap[2]	Au
24.	Dee[2]	Au
25.	Queen Lode[2]	$BaSO_4$
26.	Rossi[2]	$BaSO_4$
27.	Ivanhoe	Au
28.	McDermitt[2]	Hg
29.	Montana Mountains[2]	Li
30.	Getchell[2]	Au
31.	Tonopah[2]	W
32.	Riley Extension	W
33.	Riley	W
34.	Granite Creek	W
35.	Pinson[2]	Au
36.	Preble[2]	Au
37.	Hog Ranch	Au
38.	Lewis	Au
39.	Springer[2]	W
40.	Florida Canyon	Au
41.	Bloody Canyon[2]	Sb
42.	Rochester[2]	Ag
43.	Sutherland[2]	Sb
44.	Relief Canyon[2]	Au
45.	Hollywood[2]	Sb
46.	Fencemaker[2]	Sb
47.	Dodge-Ford[2]	Fe
48.	Buena Vista[2]	Fe
49.	Piute[2]	Fe
50.	Hoyt	Sb
51.	Drumm	Sb
52.	IHX	Sb
53.	Victoria[2]	Cu
54.	Rain[2]	Au
55.	Argenta[2]	$BaSO_4$
56.	Battle Mountain Copper Basin[2].	Cu
57.	Buckingham[2]	Mo
58.	Battle Mountain Copper Canyon[2].	Au
59.	Miller	$BaSO_4$
60.	Pleasant View	$BaSO_4$
61.	Slaven Canyon	$BaSO_4$
62.	Fire Creek	Au
63.	Hilltop	Au
64.	Mountain Springs[2]	$BaSO_4$
65.	Greystone[2]	$BaSO_4$
66.	Modarelli[2]	Fe
67.	Buckhorn[2]	Au
68.	Horse Canyon[2]	Au
69.	Cortez	Au
70.	Bald Mountain	$BaSO_4$
71.	Tonkin Springs[2]	Au
72.	Gold Bar	Au
73.	Mount Hope[2]	Mo
74.	Bald Mountain[2]	Au
75.	Alligator Ridge[2]	Au
76.	Mountain View	Pb-Zn
77.	Ruby Hill[2]	Pb-Zn
78.	Windfall[2]	Au
79.	Bisoni[2]	CaF_2
80.	Gibellini[2]	Mn
81.	Ridge 7129[2]	Zn
82.	Monte Cristo	W
83.	McGill Tailings[2]	Cu
84.	Robinson district[2]	Cu
85.	Ward[2]	Pb-Zn
86.	Taylor[2]	Ag
87.	Mount Wheeler[2]	Be
88.	Altanta[2]	Au
89.	White Pine[2]	CaF_2
90.	Linka[2]	W
91.	Dry Canyon	Au
92.	Antimony King[2]	Sb
93.	Dry Canyon[2]	Sb
94.	Bray-Beulah[2]	Sb
95.	Hard Luck-Pradier[2]	Sb
96.	Reeds Canyon	$BaSO_4$
97.	Victorine-Kingston	Au
98.	P & S[2]	$BaSO_4$
99.	Kay[2]	$BaSO_4$
100	Northumberland[2]	Au
101	Ann[2]	$BaSO_4$
102	East Northumberland[2].	$BaSO_4$
103	Round Mountain[2]	Au
104	White Caps[2]	Sb
105	Manhattan[2]	Au
106	Nevada Moly[2]	Mo
107	Gooseberry[2]	Ag
108	Dayton[2]	Fe
109	Gold Hill	Au
110	Lucerne	Au
111	Carson River[2]	Hg
112	Minnesota[2]	Fe
113	McArthur[2]	Cu
114	Buckskin	Au
115	Ann Mason[2]	Cu
116	Yerington[2]	Cu
117	Bear[2]	Cu
118	Pumpkin Hollow[2]	Fe
119	Calico Hills[2]	Fe
120	Bell Mountain[2]	Au
121	Rawhide	Au
122	Nevada Scheelite[2]	W
123	Phelps-Stokes[2]	Fe
124	Basic, Inc.[2]	MgO
125	Union Canyon	CaF_2
126	Chicago Lode	CaF_2
127	B & C Springs[2]	Mo
128	Paradise Peak	Au
129	Hawthorne	Al
130	Borealis[2]	Au
131	Aurora[2]	Au
132	Santa Fe[2]	Au
133	Gunmetal[2]	W
134	Desert Scheelite	W
135	Pilot Mountain district.	Hg
136	Pine Nut	Mo
137	Candelaria[2]	Ag
138	New Potosi	Sb
139	B & B[2]	Hg
140	Tonopah Hasbrouck[2]	Au
141	Tonopah Divide[2]	Au
142	Goldfield[2]	Au
143	Goldfield district	Al
144	Silver Peak[2]	Li
145	Mohawk	Ag
146	Sixteen-to-One[2]	Ag
147	Crowell[2]	CaF_2
148	Sterling[2]	Au
149	Rainbow[2]	CaF_2
150	Nyco[2]	CaF_2
151	Horseshoe	CaF_2
152	Mammoth[2]	CaF_2
153	Caselton[2]	Pb-Zn
154	Prince[2]	Pb-Zn
155	Pan American[2]	Pb-Zn
156	Emerson[2]	W
157	Boyd	Al
158	C-M Alunite[2]	Al
159	Overton[2]	MgO
160	Virgin River[2]	Mn
161	Fannie Ryan[2]	Mn
162	Three Kids[2]	Mn
163	Potosi	Pb-Zn
164	Yellow Pine	Pb-Zn
165	Argentena	Pb-Zn
166	Boulder City[2]	Mn
167	Eldorado Canyon	Au

Deposit name	(1)	Map No.
Alligator Ridge[2]	Au	75
Ann[2]	$BaSO_4$	101
Ann Mason[2]	Cu	115
Antimony King[2]	Sb	92
Argenta[2]	$BaSO_4$	55
Argentena	Pb-Zn	165
Atlanta[2]	Au	88
Aurora[2]	Au	131
B & B[2]	Hg	139
B & C Springs[2]	Mo	127
Bald Mountain[2]	Au	74
Bald Mountain	$BaSO_4$	70
Basic, Inc.[2]	MgO	124
Battle Mountain Copper Basin[2].	Cu	56
Battle Mountain Copper Canyon[2].	Au	58
Bear[2]	Cu	117
Bell Mountain[2]	Au	120
Big Ledge[2]	$BaSO_4$	6
Bisoni[2]	CaF_2	79
Bloody Canyon[2]	Sb	41
Blue Star[2]	Au	21
Bootstrap[2]	Au	23
Borealis[2]	Au	130
Boulder City[2]	Mn	166
Boyd	Al	157
Bray-Beulah[2]	Sb	94
Buckhorn[2]	Au	67
Buckingham[2]	Mo	57
Buckskin	Au	114
Buena Vista[2]	Fe	48
Bullion Monarch[2]	Au	20
C-M Alunite[2]	Al	158
Calico Hills[2]	Fe	119
Candelaria[2]	Ag	137
Carlin[2]	Au	19
Carson River[2]	Hg	111
Caselton[2]	Pb-Zn	153
Chicago Lode	CaF_2	126
Cortez	Au	69
Crowell[2]	CaF_2	147
Dayton[2]	Fe	108
Dee[2]	Au	24
Desert Scheelite	W	134
Dexter	Au	13
Dodge-Ford[2]	Fe	47
Drumm	Sb	51
Dry Canyon	Au	91
Dry Canyon[2]	Sb	93
East Northumberland[2].	$BaSO_4$	102
Easy Miner[2]	$BaSO_4$	3
Eldorado Canyon	Au	167
Emerson[2]	W	156
Enfield Bell[2]	Au	10
Fannie Ryan[2]	Mn	161
Fencemaker[2]	Sb	46
Fire Creek	Au	62
Fish Creek[2]	$BaSO_4$	15
Florida Canyon	Au	40
Gance Creek	Au	11
Garnet-Tennessee Mountain[2].	W	8
Getchell[2]	Au	30
Gibellini[2]	Mn	80
Gold Bar	Au	72
Gold Hill	Au	109
Gold Quarry[2]	Au	17
Goldfield[2]	Au	142
Goldfield district	Al	143
Goldstrike[2]	Au	22
Gooseberry[2]	Ag	107
Granite Creek	W	34
Greystone[2]	$BaSO_4$	65
Gunmetal[2]	W	133
Hard Luck-Pradier[2]	Sb	95
Hawthorne	Al	129
Heavy Spar[2]	$BaSO_4$	16
Hilltop	Au	63
Hog Ranch	Au	37
Hollywood[2]	Sb	45
Horse Canyon[2]	Au	68
Horseshoe	CaF_2	151
Hoyt	Sb	50
IHX	Sb	52
Indian Springs[2]	W	1
Ivanhoe	Au	27
Jungle[2]	$BaSO_4$	2
Kay[2]	$BaSO_4$	99
Lakes[2]	$BaSO_4$	14
Lewis	Au	38
Linka[2]	W	90
Lucerne	Au	110
Maggie Creek[2]	Au	18
Mammoth[2]	CaF_2	152
Manhattan[2]	Au	105
McArthur[2]	Cu	113
McDermitt[2]	Hg	28
McGill Tailings[2]	Cu	83
Mesona	Au	9
Miller	$BaSO_4$	59
Minnesota[2]	Fe	112
Modarelli[2]	Fe	66
Mohawk	Ag	145
Montana Mountains[2]	Li	29
Monte Cristo	W	82
Mount Hope[2]	Mo	73
Mount Wheeler[2]	Be	87
Mountain Springs[2]	$BaSO_4$	64
Mountain View	Pb-Zn	76
Nevada Moly[2]	Mo	106
Nevada Scheelite[2]	W	122
New Potosi	Sb	138
Northumberland[2]	Au	100
Nyco[2]	CaF_2	150
Overton[2]	MgO	159
P & S[2]	$BaSO_4$	98
Pan American[2]	Pb-Zn	155
Paraside Peak	Au	128
Phelps-Stokes[2]	Fe	123
Pilot Mountain district.	Hg	135
Pine Nut	Mo	136
Pinson[2]	Au	35
Piute[2]	Fe	49
Pleasant View	$BaSO_4$	60
Potosi	Pb-Zn	163
Preble[2]	Au	36
Prince[2]	Pb-Zn	154
Pumpkin Hollow[2]	Fe	118
Q-Bar	$BaSO_4$	12
Queen Lode[2]	$BaSO_4$	25
Rain[2]	Au	54
Rainbow[2]	CaF_2	149
Rawhide	Au	121
Reeds Canyon	$BaSO_4$	96
Relief Canyon[2]	Au	44
Ridge 7129[2]	Zn	81
Riley	W	33
Riley Extension	W	32
Robinson district[2]	Cu	84
Rochester[2]	Ag	42
Rossi[2]	$BaSO_4$	26
Round Mountain[2]	Au	103
Ruby Hill[2]	Pb-Zn	77
Santa Fe[2]	Au	132
Silver Peak[2]	Li	144
Sixteen-to-One[2]	Ag	146
Slaven Canyon	$BaSO_4$	61
Snoose[2]	$BaSO_4$	5
Springer[2]	W	39
Sterling[2]	Au	148
Stormy Creek[2]	$BaSO_4$	7
Sutherland[2]	Sb	43
Taylor[2]	Ag	86
Three Kids[2]	Mn	162
Tonkin Springs[2]	Au	71
Tonopah[2]	W	31
Tonopah Divide[2]	Au	141
Tonopah Hasbrouck[2]	Au	140
Union Canyon	CaF_2	125
Victoria[2]	Cu	53
Victorine-Kingston	Au	97
Virgin River[2]	Mn	160
Ward[2]	Pb-Zn	85
Wells	W	4
White Caps[2]	Sb	104
White Pine[2]	CaF_2	89
Windfall[2]	Au	78
Yellow Pine	Pb-Zn	164
Yerington[2]	Cu	116

[1] Primary commodity.

[2] Deposit abstract in report.

Table 2. — Distribution of principal deposits of selected commodities in Nevada, by county

County	Aluminum		Antimony		Barite		Beryllium		Copper		Fluorspar		Gold		Iron ore		Lead-zinc	
	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs
Carson City																		
Churchill . .			3										1	1	1	1		
Clark													1				3	
Douglas . . .													1		1	1		
Elko					11	10			1	1			8	4				
Esmeralda	1												3	3				
Eureka . . .											1	1	12	10	1	1	3	2
Humboldt .													4	3				
Lander . . .			4	4	8	3			1	1			5	1				
Lincoln . . .	2	1											1	1			3	3
Lyon									4	4			1		2	2		
Mineral . . .	1		1										4	3	1	1		
Nye			1	1	4	4					8	5	5	4	1	1		
Pershing . .			4	4									2	1	2	2		
Storey													1					
Washoe . . .													1					
White Pine							1	1	2	2			2	2			1	1
Total . . .	4	1	13	9	23	17	1	1	8	8	9	6	52	33	9	9	10	6

County	Lithium		Magnesium		Manganese		Mercury		Molybdenum		Silver		Tungsten		Total	
	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Dep	Abs	Deposit	Abstract
Carson City							1	1							1	1
Churchill . .															5	2
Clark			1	1	4	4									9	5
Douglas . . .															2	1
Elko													3	2	23	17
Esmeralda	1	1					1	1			2	1			8	6
Eureka . . .					1	1			1	1					19	16
Humboldt .	1	1					1	1					4	1	10	6
Lander . . .									1	1			1	1	20	11
Lincoln . . .													1	1	7	6
Lyon															7	6
Mineral . . .							1		1		1	1	3	2	13	7
Nye			1	1					2	2					22	18
Pershing . .											1	1	1	1	10	9
Storey											1	1			2	1
Washoe . . .															1	
White Pine											1	1	1		8	7
Total . . .	2	2	2	2	5	5	4	3	5	4	6	5	14	8	167	119

NOTE: — No entry in a column indicates that no principal deposits were identified or no abstract was prepared.

SUMMARY OF MINING ACTIVITIES IN NEVADA (*30, 382, 728*)

Mining has long occupied an important place in the history and economy of Nevada. Through television and movies, millions of Americans are aware, albeit vaguely, of the fabulous wealth created from mining of the State's gold and silver deposits during the late 19th and early 20th century. Some people may also be aware that Nevada achieved statehood in 1864 in part because of the Union's need of precious metals to finance the Civil War. Few people outside the mining community, however, are aware that mining continues as a major contributor to the State's economy. Although only ranked 13th nationally in the value of nonfuel mineral production, Nevada led the nation in 1982 in the output of gold, barite, mercury, and magnesite. In addition, it was second in mine production of diatomite and lithium minerals, and third in output of fluorspar, molybdenum, and tungsten concentrates.

The first mining in Nevada was conducted by Indians in search of turquoise and salt. Franciscan monks and their Mexican converts worked gold placers, silver lodes, and turquoise deposits in Clark County prior to the 1840's. Evidence indicates that Mexicans also mined in the San Antone mining district in about 1854, and French trappers from Canada journeyed as far south as Nye County, perhaps in search of gold or silver, prior to the 1860's. The late 1850's, however, is generally accepted as the beginning of Nevada's mining industry with the discovery of the Potosi Mine in the Goodsprings district, Clark County (1855 or 1857), and the Comstock Lode in Storey County (1859). These discoveries stimulated numerous other discoveries throughout the State, and both the economy and the population increased rapidly.

Over the next two decades, output from the State's mines, particularly those of the Comstock Lode, grew and reached a peak in about 1878. In the 1880's, mineral production began a precipitous decline that continued into the 20th century. Recovery began in the early 1900's with the discovery and subsequent production of silver and gold from ore bodies in the Tonopah, Goldfield, Rochester, and other mining districts. About the same time, significant copper production from the Ely and Yerington districts, and zinc production from the Goodsprings district began. The value of mineral production rose to a peak during World War I, but after the war, metal prices fell and output once again declined.

During the 1930's, in response to increased gold and silver prices and increased demand for base metals, output again increased from Nevada's mines. In spite of periodic setbacks, production generally continued to expand through World War II and into the postwar period. Output reached a peak in 1956 when constant dollar value of mineral production for the State was nearly \$202[5] million. In 1957, output slumped 30% when copper prices fell, lead and zinc demand declined, and the Federal Government curtailed the tungsten purchasing program. Since bottoming in 1958 when constant dollar value of mineral production was slightly over \$103[5] million, the constant dollar value of production of nonfuel minerals has grown to nearly \$254[5] million in 1982.

Although Nevada periodically was among the leading States in domestic production of tungsten, manganese, gold, barite, and mercury, it was the mining, milling, and smelting of copper ores that dominated the State's mineral industry from the mid-1930's to mid-1970's. During a two-decade period, from 1955 to 1974, annual copper production accounted for over 50% of the State's total value of nonfuel mineral output. The only exception during these 20 yr occurred in 1967 when a protracted industry-wide strike resulted in a substantial reduction in copper production. In spite of the strike, the value of copper ore mined in 1967 amounted to nearly \$39 million or about 43% of the State's total mineral production.

Nevada's copper output peaked in 1970 when the ore mined yielded nearly 97,000 t of copper valued at over \$123 million or about two-thirds of the State's total mineral production. Mine output slowly decreased through the early and mid-1970's; in 1978, it plummeted when the three leading companies ceased operations citing poor market conditions and environmental restrictions as causes. Copper output has increased modestly since the 1979 low point; however, production data are withheld from publication at the request of the producers to safeguard proprietary company data.

Nevada is currently experiencing a modern day "gold rush," and gold has replaced copper as the most important commodity mined in the State. In 1983, for the fourth consecutive year, Nevada led the Nation in primary gold production in which mines yielded more than 47% of the gold produced domestically.

The resurgence of gold mining stems from two unrelated factors. First was the discovery in the early 1960's of low-grade, near-surface, disseminated, micrometer-sized gold resources in northeastern Eureka County. The discovery was followed by development of and subsequent production from the Carlin Mine in 1965 and the Cortez Mine in 1969. Second was the dramatic increase in domestic gold prices caused by the establishment of the two-tier pricing system in March 1968, which created an open market price for gold that could fluctuate with supply and demand, and by the removal of restrictions on private ownership of gold in December 1974.

As a result of these two actions, the price of gold rose from \$1.13/g (\$35/tr oz) in 1967 to over \$19.29/g (\$600/tr oz) in 1980, and provided the economic incentive for domestic producers to explore and develop deposits. As a consequence, Nevada has seen a large increase in gold exploration activities over the past decade, which has resulted in the development of many new mines, either currently operating or projected to come on-stream in the next few years. The outlook is for Nevada's mines to yield more than a million ounces annually by the mid-1980's if the present trend continues.

INFRASTRUCTURAL AND INSTITUTIONAL FACTORS AFFECTING MINING ACTIVITIES IN NEVADA

UTILITIES

Electricity

Nevada is served by a mix of investor-owned and publicly owned electric utility systems. Figure 2 displays the distribution of major electrical transmission lines, principal substations, and in-state generating facilities. Figure 3 illustrates the certificated service areas as designated by the Nevada Public Service Commission for the State's larger distribution systems. Several smaller systems occur throughout the State but are not shown on figure 3.

According to the Public Service Commission, utilities having a certificated service area have exclusive rights to market electricity in the area. The utilities also have an obligation to provide power to all new consumers. Service in the uncertificated areas is somewhat competitive with any utility having the right to market electricity subject to granting of a certificate by the Public Service Commission.

As of December 1983, all principal utilities had indicated electrical supplies were generally adequate for new or expanded mining and mineral processing facilities. However, large consumers should expect up to a 2-yr lead time for planning, permitting, and construction of new power lines and ancillary facilities. In addition, mining consumers would be required to pay the total installation cost of facilities serving their operations prior to the beginning of construction. In late 1982, the cost of a 10-MW substation was estimated at about \$450,000, any three-phase line at approximately \$19,000/km (\$30,000/mi), and a 138-kV transmission line at \$50,000/km (\$80,000/mi). Although recovery of construction capital is generally incorporated into rate schedules, some isolated mining operations have installed diesel-powered plants for generating electricity rather than incur the large capital expenditure required for construction of transmission facilities.

Table 3 presents representative industrial power rates for the principal utilities in Nevada.

Natural Gas (*689*)

Natural gas is supplied to Nevada by two main transmission lines. One line enters the State from the north

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[5] 1972 constant dollar, gross national product basis.

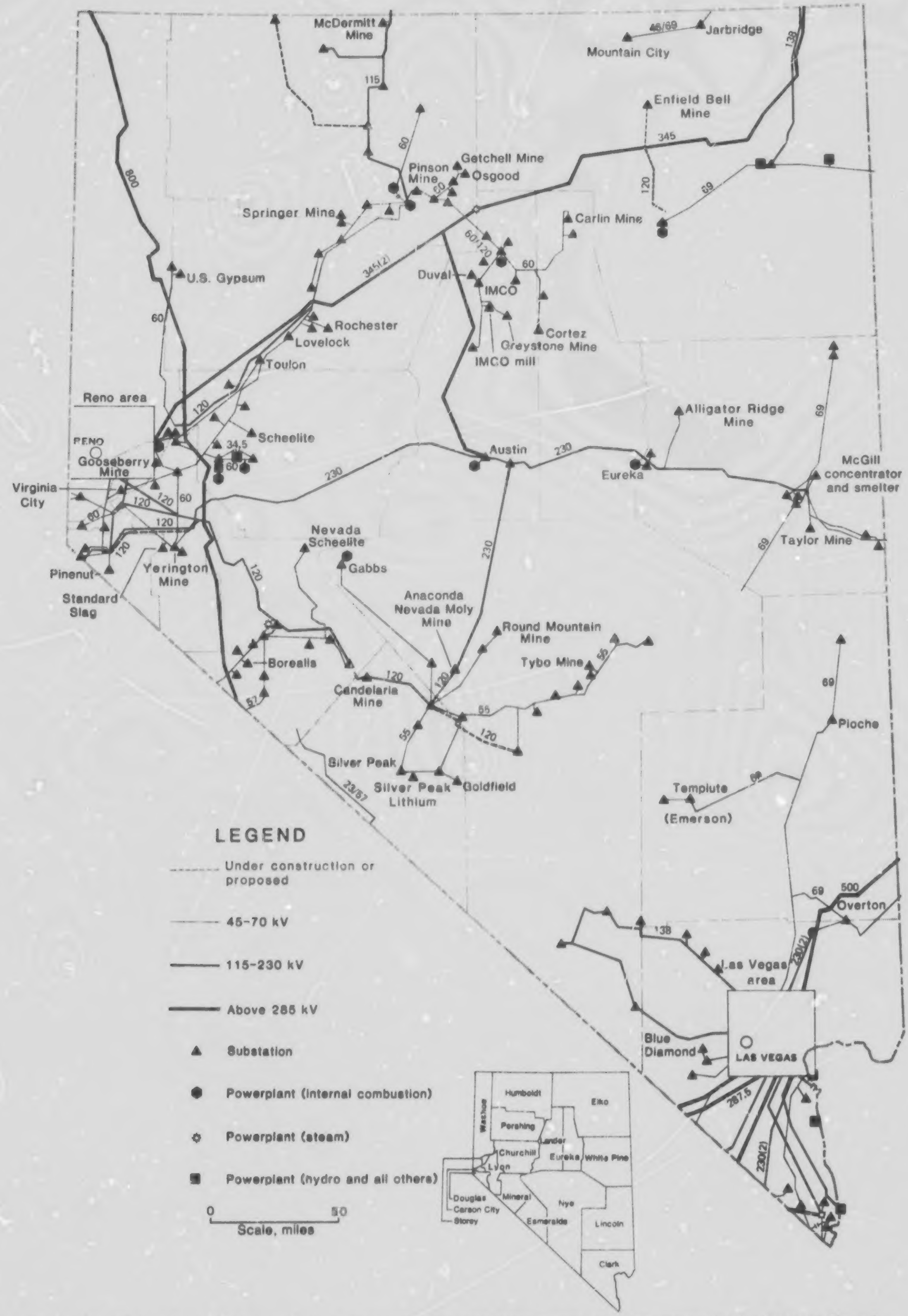
McDermitt Mine
Mountain City
46/69
Jarbridge
138
115
Enfield Bell Mine
345
60
Pinson Mine
Getchell Mine
Osgood
60
120
69
Springer Mine
Carlin Mine
800
345(2)
60-120
60
Duval
IMCO
U.S. Gypsum
60
Rochester
Lovelock
Cortez
Greystone Mine
IMCO mill
Toulon
Reno area
120
Alligator Ridge Mine
69
RENO
Scheelite
34.5
Gooseberry Mine
60
Austin
230
230
Eureka
McGill concentrator and smelter
Virginia City
120
120
60
60
120
Taylor Mine
69
120
Nevada Scheelite
Gabbs
230
Pinenut
Yerington Mine
120
Standard Slag
Anaconda Nevada Moly Mine
Round Mountain Mine
Borealis
Tybo Mine
55
120
120
Candelaria Mine
57
69
55
55
120
Pioche
Silver Peak
Silver Peak Lithium
Goldfield
23/57
Templute
69
(Emerson)
LEGEND
Under construction or proposed
45-70 kV
115-230 kV
Above 285 kV
Substation
Powerplant (internal combustion)
Powerplant (steam)
Powerplant (hydro and all others)
0
50
Scale, miles
69
500
Overton
138
Las Vegas area
230(2)
Blue Diamond
LAS VEGAS
287.5
230(2)
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 2.—Major electrical transmission lines, principal substations, and in-state generating facilities in Nevada.

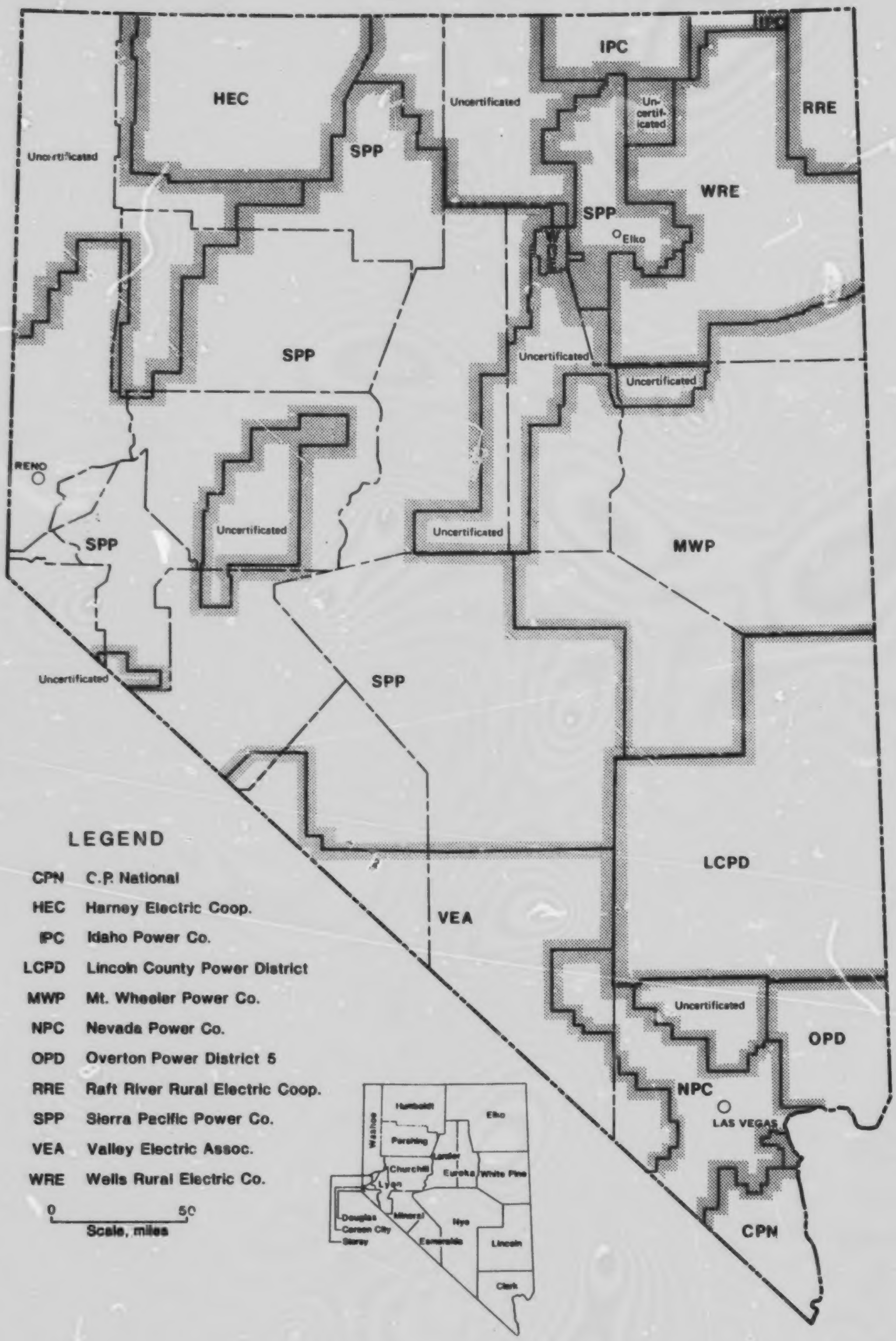
HEC
IPC
IPC
RRE
Uncertificated
Uncertificated
Un-certif-icated
SPP
SPP
WRE
Elko
Uncertificated
Uncertificated
SPP
RENO
Uncertificated
Uncertificated
SPP
MWP
Uncertificated
SPP
LCPD
VEA
Uncertificated
OPD
NPC
LAS VEGAS
CPN
LEGEND
CPN C.P. National
HEC Harney Electric Coop.
IPC Idaho Power Co.
LCPD Lincoln County Power District
MWP Mt. Wheeler Power Co.
NPC Nevada Power Co.
OPD Overton Power District 5
RRE Raft River Rural Electric Coop.
SPP Sierra Pacific Power Co.
VEA Valley Electric Assoc.
WRE Wells Rural Electric Co.
0
50
Scale, miles
Washoe
Humboldt
Elko
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 3.—Major certificated electricity service areas in Nevada.

Table 3. — Representative industrial electrical power rates in Nevada, December 1983

Utility	Customer monthly meter charge	Demand charge per kW/ month	Energy charge per kW•h used
C. P. National	$5.30	NAp	$0.05132
Harney Electric Cooperative, Inc.	150.00	$5.00	.039
Idaho Power Co.[1]	NAp	2.50	.1557
Lincoln County Power District 1	86.40	1.35	.0099
Mt. Wheeler Power Company	2.60	2.75	[2].0537 [3].0453
Nevada Power Co.	3.50	2.90	.0441
Overton Power District 5	NAp	1.10	[4].030 [5].024
Raft River Rural Electric Cooperative	NAp	4.75	.025 .024
Sierra Pacific Power Co.	NAp	[6]5.18 [7]4.48	.05217
Valley Electric Association, Inc.[8]	NAp	8.176	.028
Wells Rural Electric Co	50.00	4.00	.035

NAp Not applicable.

[1] Idaho Power Co. has made an application to the State of Nevada requesting a 57% increase in the energy charge.

[2] 1st 50,000 kW•h.

[3] Over 50,000 kW•h.

[4] 1st 100 kW•h.

[5] Over 100 kW•h.

[6] 1st 1,000 kW; 1,000-kW minimum.

[7] Over 1,000 kW.

[8] Only single-phase power available.

and after crossing the Idaho-Nevada State line in Elko County, runs directly to the Reno-Sparks area. The line has main laterals serving gas to Winnemucca, Battle Mountain, and Elko; to Fernley, Fallon, and Gabbs; to the Fort Churchill area; to Yerington; and to the Carson City and Minden areas. The second transmission line supplies gas from the southwest States. It enters the southernmost tip of the State and terminates in the Las Vegas area after passing north through Searchlight and Henderson. Short laterals extend to the Davis Dam, Blue Diamond gypsum mine and plant (a short distance west of Las Vegas), and Glendale areas. Figure 4 shows the natural gas transmission network in Nevada.

The Southwest Gas Corp. (Southwest) is the intrastate supplier of gas and owns all main transmission and lateral lines. Southwest furnishes gas to the Sierra Pacific Power (SPP) and C. P. National (CPN) public utility companies for distribution. Sierra Pacific resells the gas in its service territory that essentially consists of the Reno, Sparks, and Verdi municipalities (*106*). C. P. National distributes gas at retail in the city of Henderson, located south of Las Vegas. Southwest's Northern and Southern Divisions distribute gas to all other communities served by natural gas in the State. Cities and towns served by the Northern Division include Elko, Carlin, Battle Mountain, Winnemucca, Lovelock, Fernley, Fallon, Wadsworth, Dayton, Silver Springs, Garnerville, Silver City, Minden, Incline Village, and Stateline. The Southern Division retail sales include customers in the Las Vegas, North Las Vegas, and Boulder City areas.

Southwest's extensive Nevada pipeline network was built as a result of potential revenues to be gained from the use of natural gas for firing steam electric generators and in mining and metal refining operations (*106*). In response to a rapid rise in gas rates, a major defection of large-volume industrial and powerplant customers occurred between 1980 and 1982. Those customers who could, switched from gas to residual oil for their fuel needs. Due primarily to this decline of industrial customers within the Southwest system, natural gas supplies are, and will be, readily available in the foreseeable future for existing and new industrial customers.

Water (*384, 459, 682, 684*)

Nevada is the most arid State in the Union averaging slightly less than 23 cm of precipitation annually. Precipitation will vary from about 7.5 cm in the most arid valley to 100 to 150 cm in certain mountainous areas. About 84% of Nevada's land area lies within the Great Basin section of the Basin and Range province. The Great Basin area is characterized by drainage flows into enclosed basins rather than the sea. Water supplying these intermontane basins is principally from storm runoff and snowmelt occurring mostly during the spring and early summer months. Except for times of high flow when ephemeral lakes or playas may be formed, most mountain streams terminate prior to reaching the basin floors. The annual evaporation rate is high within the State, ranging from about 1 m in the northeastern part of the State to as high as 2 m in the southernmost part. Nevada has few large streams or rivers. Unlike those in other States, these streams decrease in size and increase in dissolved mineral content as they flow. Nevada has several large lakes, but these are generally peripheral to the central portion of the State's land mass.

Nevada mining operations rely heavily on ground water as a source of water. The water supply is usually developed by a well, often several, drilled into deep saturated sediments filling the intermontane basins. Though often containing immense quantities of water built up and stored over centuries, the average annual water recharge is relatively small. If water usage is not kept at or below the rate of recharge, shortages will result. Prolonged ground water consumption greater than annual recharge would result in long-term problems for all users. It has been estimated that, even in the largest of Nevada's basins, the annual recharge does not greatly exceed 61.7 million m^3, and in perhaps half the valleys, recharge is less than 18.5 million. Table 4 presents a summary of Nevada water resources (*682*).

There are other factors besides the limited supply that affect the supply and availability of water in Nevada for development. These include water quality, low yield, temperature, ground water movement, and water rights. In some basins or portions thereof, water may be highly mineralized or contain substantial amounts of undesirable dissolved salts. Generally, water resources for mining are developed on the edges of basins where water is usually of higher quality compared with that contained in the central portions of the basin. Some basins known to have moderate-to-large yields will have areas of low yield, which results in wells with high drawdown rates. Though usually not a great problem for mine and mill consumption, above normal water temperatures occur in many areas of the State.

Problems also arise in developing water resources in basins that are closed topographically but are not closed hydraulically. As a result of water moving from one basin to another beneath topographic divides, water development and consumption in one basin can have broad unexpected effects in adjacent basins. Problems with water availability due to infringement of water rights occur throughout the State. The problems are exacerbated by the largely unknown and little understood hydraulic systems, par-

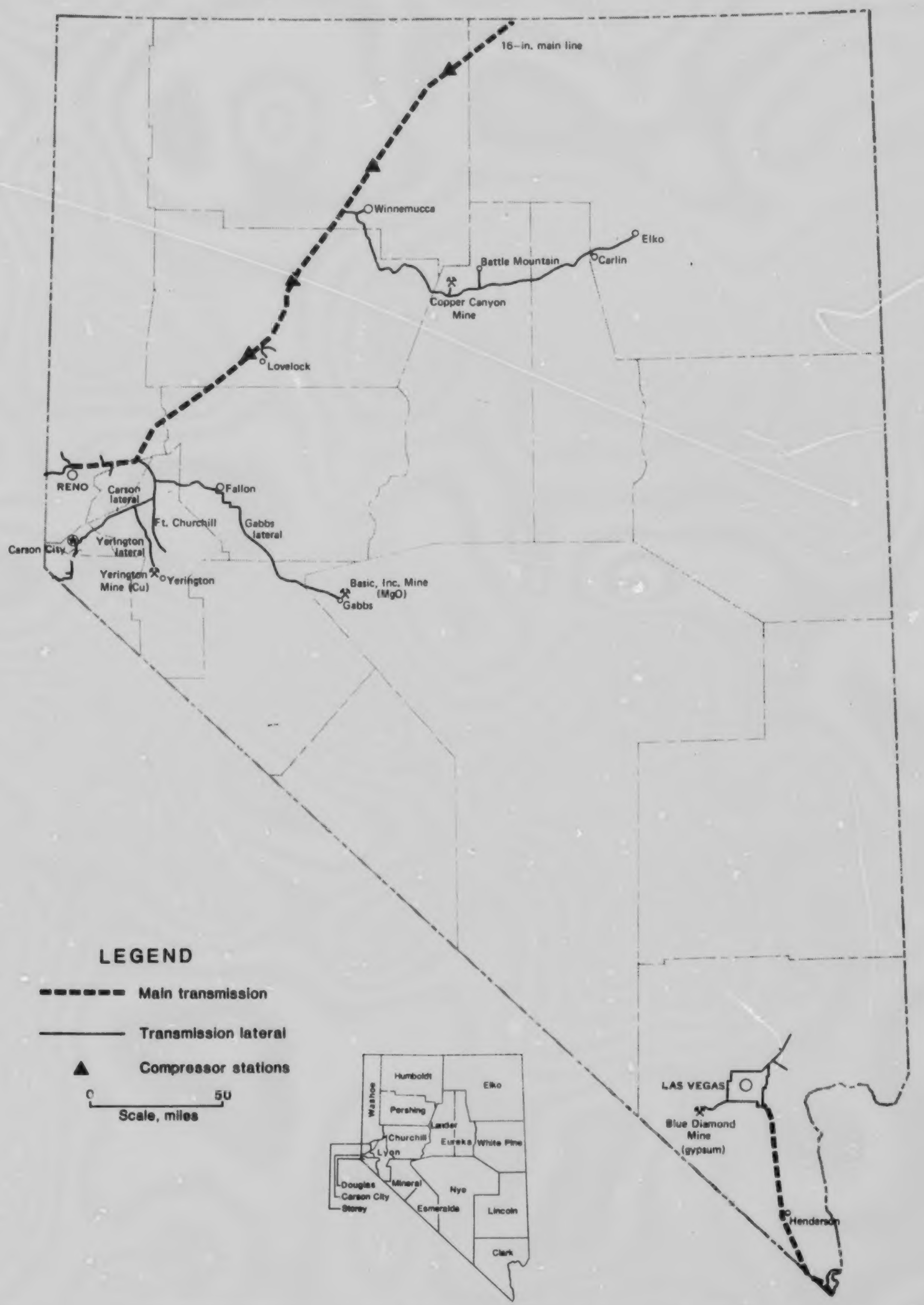
16-in. main line
Winnemucca
Elko
Battle Mountain
Carlin
Copper Canyon Mine
Lovelock
RENO
Carson lateral
Fallon
Ft. Churchill
Gabbs lateral
Carson City
Yerington lateral
Yerington Mine (Cu)
Yerington
Basic, Inc. Mine (MgO)
Gabbs
LAS VEGAS
Blue Diamond Mine (gypsum)
Henderson
LEGEND
Main transmission
Transmission lateral
Compressor stations
0
50
Scale, miles
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Mineral
Nye
Douglas
Carson City
Storey
Esmeralda
Lincoln
Clark

Figure 4.—Natural gas distribution system in Nevada.

Table 4. — Nevada water summary (*682*)

	10^9 m^3	10^6 acre ft
Estimated annual average precipitation	67	54
Surface water:		
Estimated runoff from mountains	3.9	3.2
Estimated inflow crossing State line (excluding Colorado River)	1.6	1.3
Colorado River	12	9.7
Estimated outflow crossing State line (excluding Colorado River)[1]	.9	.7
Colorado River	12	9.4
Surface water storage capacity (excluding State's portion of Mead, Mohave, Tahoe, and Topaz)	31	25
Lake Mead	36.6	29.7
Lake Mohave	2.25	1.82
Lake Tahoe	151	122
Topaz Lake	.0733	.0594
Ground water (budget for valley-fill reservoirs):[2]		
Estimated inflow	2	2
Estimated outflow	2	2
Recharge from precipitation	2.7	2.2
Perennial yield of valley-fill reservoirs	2.1	1.7
Stored in upper 100 ft of saturated valley fill	310	250
Estimated transitional storage reserve	100	84
Estimated outflow crossing State line	.19	.15
Estimated inflow crossing State line	.004	.003

[1] Includes 1970 flow to Lake Mead from Las Vegas Wash.

[2] Water underground in a given valley.

ticularly those outside of the larger municipality and agricultural areas. Difficulties specifically occur as a result of not fully understanding the interaction between surface waters and ground water. The surface waters have long been appropriated, and as ground water is continually developed and utilized, surface water sources, with their attached legal prior use rights, may be adversely impacted.

In an arid State such as Nevada where water supplies are scarce and valuable, it has been necessary for the State government to strictly control and regulate its use. The State office that exercises authority over water use is the Division of Water Resources (DWR) of the State Department of Conservation and Natural Resources. The State Engineer is the executive head of DWR and administers the appropriation of public waters. The Division of Water Resources operates under a complex set of laws that have been developed over the past 100 yr of Nevada water usage.

For water planning and management purposes, the State of Nevada has been divided into 14 major hydrographic regions (fig. 5) of which all but two lie within the Great Basin. In turn, the hydrographic regions are further subdivided into 255 hydrographic areas. Nevada State law authorizes the State Engineer to designate ground water basins, to establish preferred uses of water within the basins, and to limit withdrawal in these areas.

As State policy, withdrawal of ground water is generally limited to that naturally recharged to the ground water basin. Additionally, Nevada Revised Statute (NRS) 533.035 states that "beneficial use shall be the basis, measure, and the limit of the right to the use of water." These guidelines result in the State Engineer assigning "designated" status to hydrographic areas where ground water resources are being depleted. By the end of 1983 there were 86 hydrographic areas throughout the State that have been so designated. In the interest of public welfare, NRS 534.120 authorizes and directs the State Engineer to declare preferred uses within these basins. Preferred uses are limited to domestic, municipal, quasimunicipal, mining, industrial, irrigation, and stock-watering uses. After preferred uses have been established for a designated basin, the State Engineer is required to appropriate the scarce water supplies in the best interest of the public when acting on water permit applications. In 1983, the State Engineer's office stated that domestic and municipal uses had the highest preferred order of use; mining had the next highest priority, above irrigation. The reason given for mining's high priority is its relatively short consumptive lifespan and importance in securing water for mine development in areas where water demand approaches and exceeds the available supply.

To gain water rights for mining and milling use, a company must submit an application for a permit to appropriate to the State Engineer. By State statue, the State Engineer is required to approve an application if there is unappropriated water at the requested source of supply and where the applicant's use does not tend to impair the value of existing rights or otherwise be detrimental to the pubic interest. An approved application—a permit—grants the applicant the right to appropriate a designated amount of water, from a particular source, for a defined purpose, and for use at a defined location.

Major mine development has encountered water availability problems in the past and no doubt will face increasing difficulties in the future as it competes with other users for scarce supplies. To date, mining has been accommodated for its water needs; however, the State is required to protect the existing rights of water users and to promote the general welfare of the State. As a result, some mine developments have been required to obtain water from relatively distant locations.

TRANSPORTATION

The Nevada highway and rail transportation systems were developed under the influences of supply and demand. State highways initially were developed along frontier trails. Once much more extensive, railroads in the State were built to carry Nevada ores from mines to distant smelters. In many cases they were replaced by highways in response to social pressures for road connections between towns. Many rail lines have been abandoned.

Rail (*686, 732*)

Nevada is served by two major railroads with transcontinental connections, the Southern Pacific and the Union Pacific. The Union Pacific more than doubled its rail length within the State after merging with the Western Pacific Railroad Co. in 1983. Nevada is also served by two intrastate railroads: the Nevada Northern and the U.S. Gypsum. The Nevada Northern is a short-line carrier that suspended operations in December 1983. The U.S. Gypsum is a private line with less than 10 km of track.

Nevada's rail system is comprised of 2,421 km of rail lines consisting of 2,002 km of mainline and 419 km of branchline. Figure 6 shows Nevada's rail system. Table 5 summarizes the State rail system by carrier.

Nevada Northern Railway Co.—The Nevada Northern is a wholly owned subsidiary of the Kennecott Copper Corp. The line runs in a general north-south direction and traverses portions of Elko and White Pine Counties. At Cobre (Shafter), the Nevada Northern connects with the

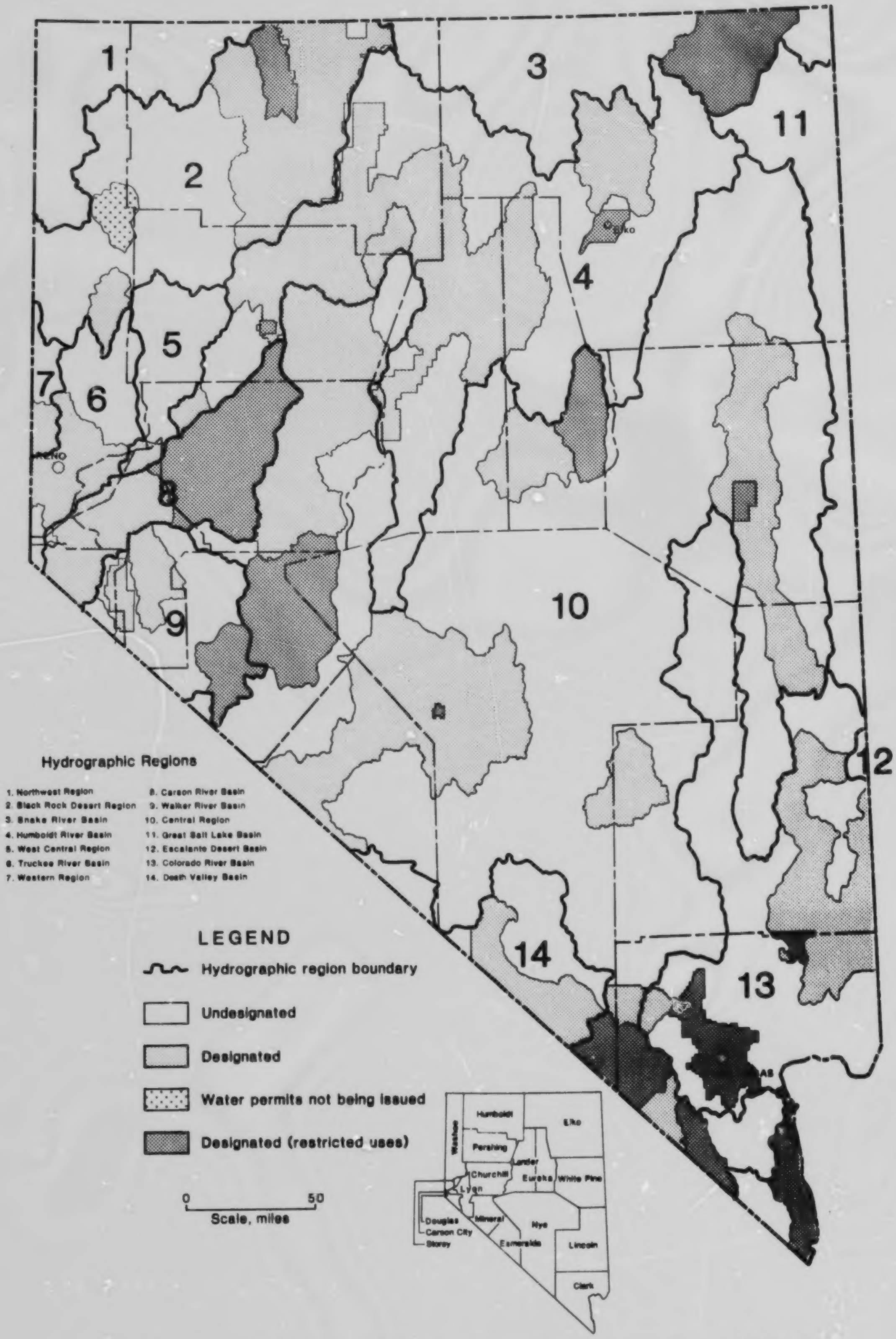
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Reno
Elko
Las
Hydrographic Regions
1. Northwest Region
2. Black Rock Desert Region
3. Snake River Basin
4. Humboldt River Basin
5. West Central Region
6. Truckee River Basin
7. Western Region
8. Carson River Basin
9. Walker River Basin
10. Central Region
11. Great Salt Lake Basin
12. Escalante Desert Basin
13. Colorado River Basin
14. Death Valley Basin
LEGEND
Hydrographic region boundary
Undesignated
Designated
Water permits not being issued
Designated (restricted uses)
0
50
Scale, miles
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 5.—Hydrographic regions and designated ground water recharge areas of Nevada.

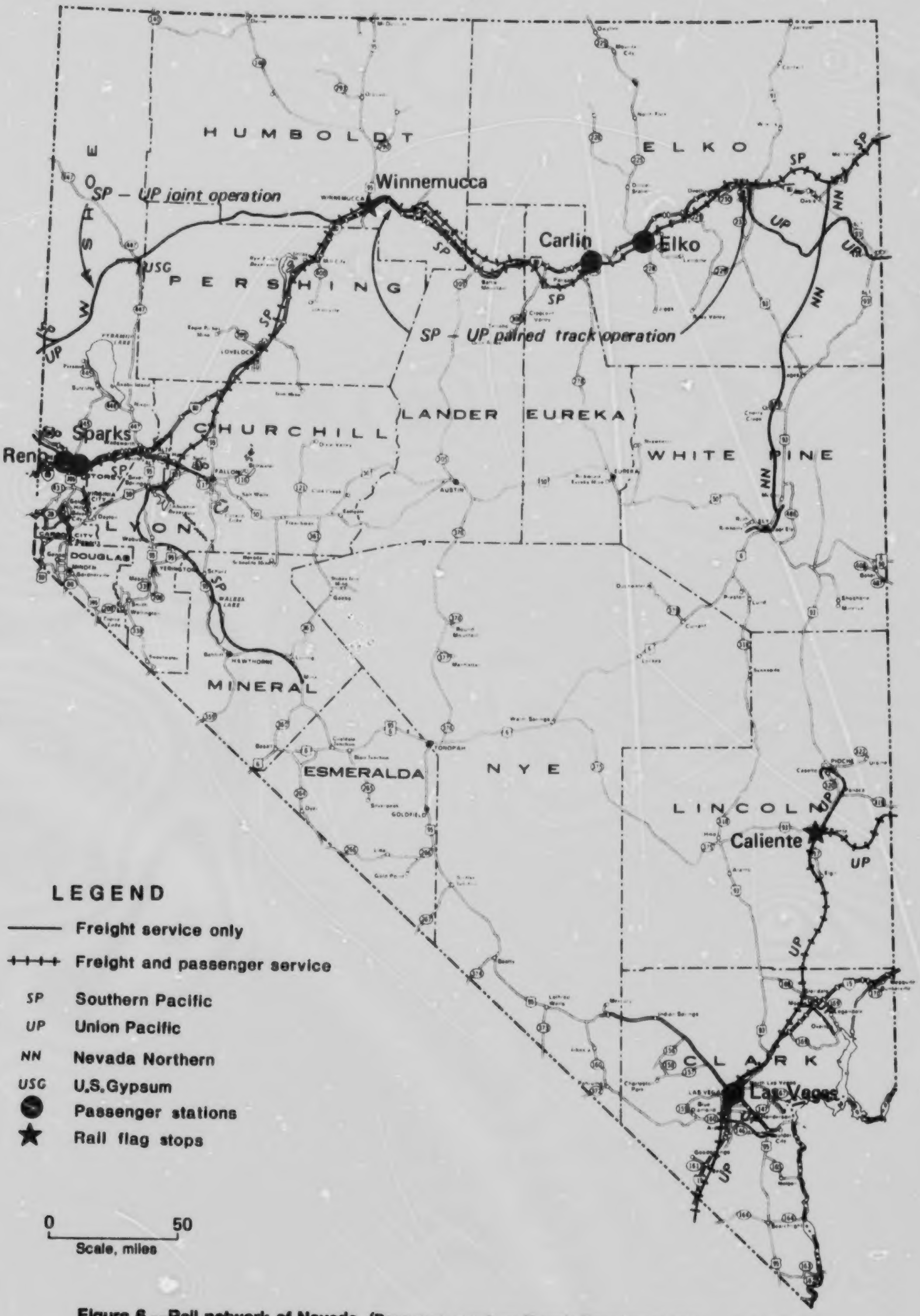
HUMBOLDT
ELKO
WASHOE
PERSHING
CHURCHILL
LANDER
EUREKA
WHITE PINE
LYON
DOUGLAS
MINERAL
ESMERALDA
NYE
LINCOLN
CLARK
Winnemucca
Carlin
Elko
Sparks
Reno
Caliente
Las Vegas
SP – UP joint operation
SP – UP paired track operation
USG
SP
UP
NN
LEGEND
Freight service only
Freight and passenger service
SP Southern Pacific
UP Union Pacific
NN Nevada Northern
USG U.S.Gypsum
Passenger stations
Rail flag stops
0
50
Scale, miles

Figure 6.—Rail network of Nevada. (Base map, courtesy Nevada Department of Transportation.)

Table 5. — Rail carriers and railage, kilometers

Carrier	Mainline	Branchline	Total	pct
Nevada Northern Railway Co.	238.2	18.8	257.0	10.6
Southern Pacific Transportation Co.	723.5	234.2	957.7	39.6
Union Pacific Railroad Co.	1,030.5	165.9	1,196.4	49.4
U.S. Gypsum	9.7	0	9.7	.4
Total	2,001.9	418.9	2,420.8	100.0

mainline of the Southern Pacific; further south it connects with the Union Pacific (formerly Western Pacific) track. The mainline extends south to Kennecott Copper Corp. inactive copper mines in the Robinson mining district. Two branchlines of the Nevada Northern connect the mainline to Kennecott's concentrator and smelter at McGill. After cessation of copper mining at the Ruth in 1976, the rail line has experienced limited use. The rail line was not abandoned but has suspended operations. Kennecott filed for abandonment in 1984. Notice of suspensions of operations are filed with the State for 6-month periods at a time.

Southern Pacific Transportation Co.—The Southern Pacific Transportation Co. is the largest of the Southern Pacific Co. subsidiaries. The company has broad financial interests including transportation, communications, and land management and development. Southern Pacific's involvement in transportation includes rail, truck, piggyback, and pipeline systems.

The Southern Pacific rail system links markets in 12 States in the west and southwest, and handles transcontinental shipments through the rail centers of New Orleans, Tucumcari (NM), Ogden, St. Louis, and Memphis. International rail shipments within Southern Pacific's system move through the U.S. Gulf and Pacific coasts and along the Mexican border.

In Nevada, the Southern Pacific offers direct mainline service to major markets in Oregon, California, Utah, Arizona, and New Mexico. Additionally, through-service is offered to points in the Pacific Northwest, Midwest, and Eastern United States. Extending east-west across northern Nevada, the Southern Pacific operates between Ogden, UT, and Roseville, CA. Connections in the Southern Pacific's Nevada rail system are made with the Union Pacific Railroad Co. (former Western Pacific) at Winnemucca and the Nevada Northern Railway Co. at Cobre (*686*).

The Southern Pacific has two branchlines in Nevada, both of which leave the mainline at Hazen, about 70 km east of Reno. One branch, the Mina, runs in a southerly direction from Hazen for about 210 km to Mina. The other branch, the Fallon, runs easterly about 25 km to Fallon.

Union Pacific Railroad Co.—The Union Pacific Railroad Co. transports diverse products and is a part of intermodal traffic in the States of California, Colorado, Idaho, Iowa, Kansas, Missouri, Montana, Nebraska, Nevada, Oregon, Utah, Washington, and Wyoming. After the 1983 merger with the Western Pacific Railroad Co., the Union Pacific added about 723 km of track (688 km of mainline) in northern Nevada to its existing 473 km northeast-southwest track system (including 342 km of mainline) in southern Nevada.

The Union Pacific rail line runs west from Salt Lake City, enters northern Nevada, and parallels the Southern Pacific's track in a cooperative paired track arrangement between a point near Wells to Winnemucca. Connections with the Nevada Northern and the Southern Pacific are at Shafter and Winnemucca, respectively. One branchline operated in the company's northern Nevada system runs 53 km (35 km of Nevada railage) from a connection point with the mainline at Reno Junction in northeastern California to the northern Reno area.

In southern Nevada, the Union Pacific passes through Las Vegas, and has about 343 km of mainline track, and about 130 km of branchline. The mainline connects major cities and towns of southern Nevada with direct lines southwest to Los Angeles and northeast to the Salt Lake City, Provo, and Ogden areas. From this hub area, direct lines exist west to San Francisco; northwest to Portland, Tacoma, and Seattle; and east where many connections exist for rail haulage to Gulf Coast ports.

Union Pacific's four branchlines in southern Nevada are the Pioche, Prince, Mead Lake, and Boulder City. Several major spurs connect the branchlines to industrial areas and military installations. The Pioche Branch, about 52 km in length, connects the Union Pacific mainline at Caliente and terminates to the north near Pioche. The Prince Branch connects with the Pioche Branch and extends 14 km west to the Caselton and Prince Mines in the Pioche mining district. The Mead Lake and Boulder City branches connect the mainline with the Nevada towns of Overton, Henderson, and Boulder City.

U.S. Gypsum.—The U.S. Gypsum Co. operates a 10-km-long private railroad from its Empire plant in Washoe County to a connection point with the Union Pacific Railroad at Gerlach, NV. Company practice in 1982 was to ship outbound finished products using five to eight cars. Two or three cars were used to haul inbound raw materials (*686*).

Road

Nevada's highway and road system is key to the mining industry's successful development of the State's mineral wealth. The system serves the seventh largest State in the Union, containing about 288,200 km^2 (110,500 mi^2) of land. The States stretches about 780 km (485 miles) north-south and about 505 km (315 miles) east-west. Federal and State highways serve interstate and intrastate movements, respectively. The county road system serves intracounty movement not served by the State system.

Nevada is traversed east to west by interstate highways I–80 and I–15. Interstate 80 traverses northern Nevada directly connecting its cities and communities including Elko, Battle Mountain, Winnemucca, and Reno to Sacramento and San Francisco to the west, and Salt Lake City to the east. Interstate 15 passes through Las Vegas providing direct connections to Los Angeles and the Salt Lake City area. Interstate highways comprise about 875 km of the State's approximately 88,100 km (1980) of roads, highways, and streets (*687*). State and county rural highways and roads make up about 77,700 km. Figures 7 and 8 show the State's road and highway system and the approximate haul distances between major points. Figure 9 shows the relative accessibility of intrastate routes when planning for transport of heavy "overweight" mine or mill equipment loads.

Generally, intrastate movement of mine products is by truck. Commonly, movement of ores and concentrates over the State road and highway system is by contract carrier. Long-distance interstate movement of mine or mill products, characterized by large bulk and low general value, is most often by rail after products are trucked to railheads. High unit value products such as mercury and gold may be trucked for long distances. However, gold doré-bullion is

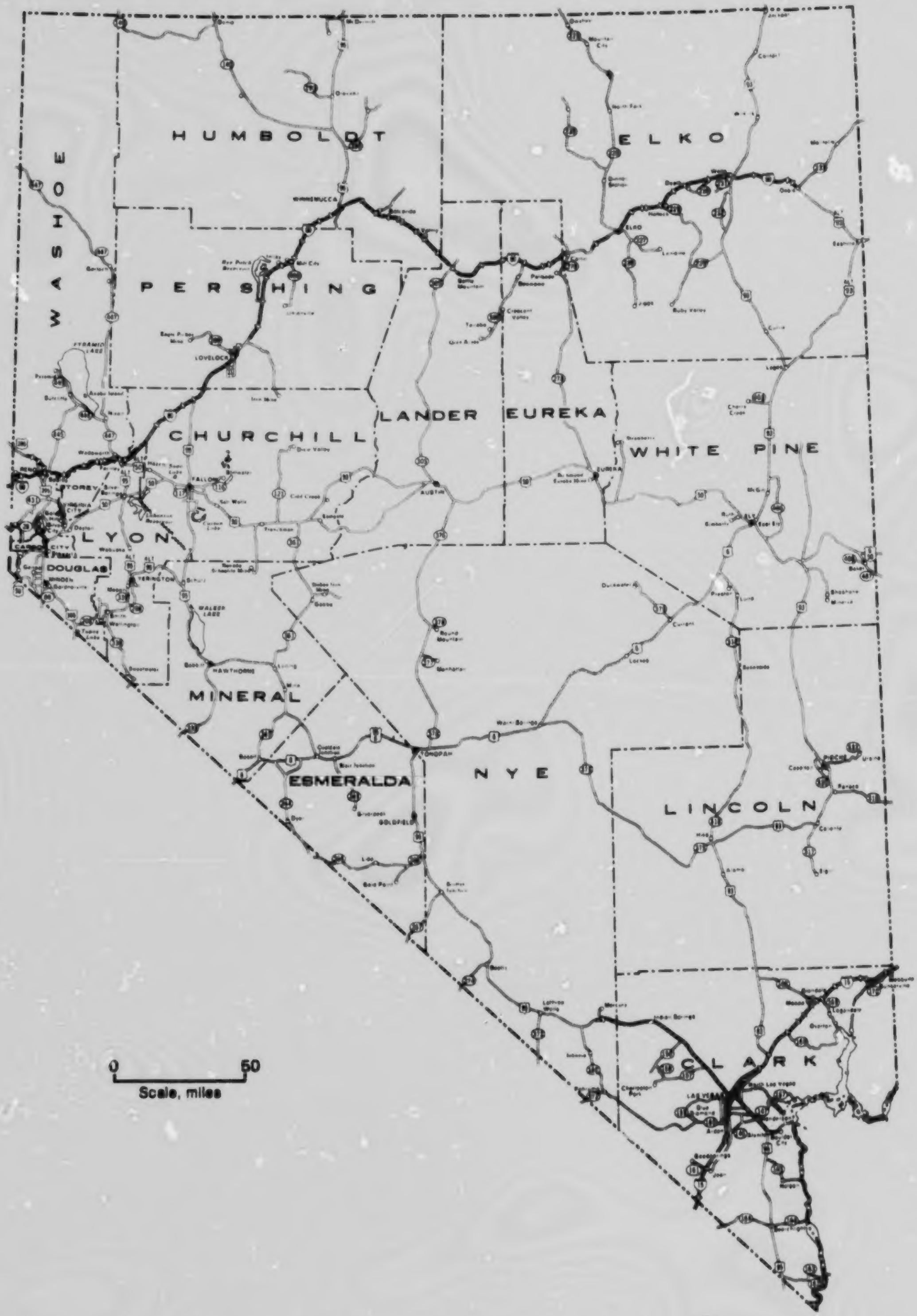
HUMBOLDT
ELKO
WASHOE
PERSHING
LANDER
EUREKA
CHURCHILL
WHITE PINE
STOREY
LYON
DOUGLAS
MINERAL
ESMERALDA
NYE
LINCOLN
CLARK
WINNEMUCCA
LOVELOCK
FALLON
AUSTIN
EUREKA
ELKO
HAWTHORNE
TONOPAH
GOLDFIELD
0
50
Scale, miles

Figure 7.—General highway map of Nevada. (Courtesy Nevada Department of Transportation.)

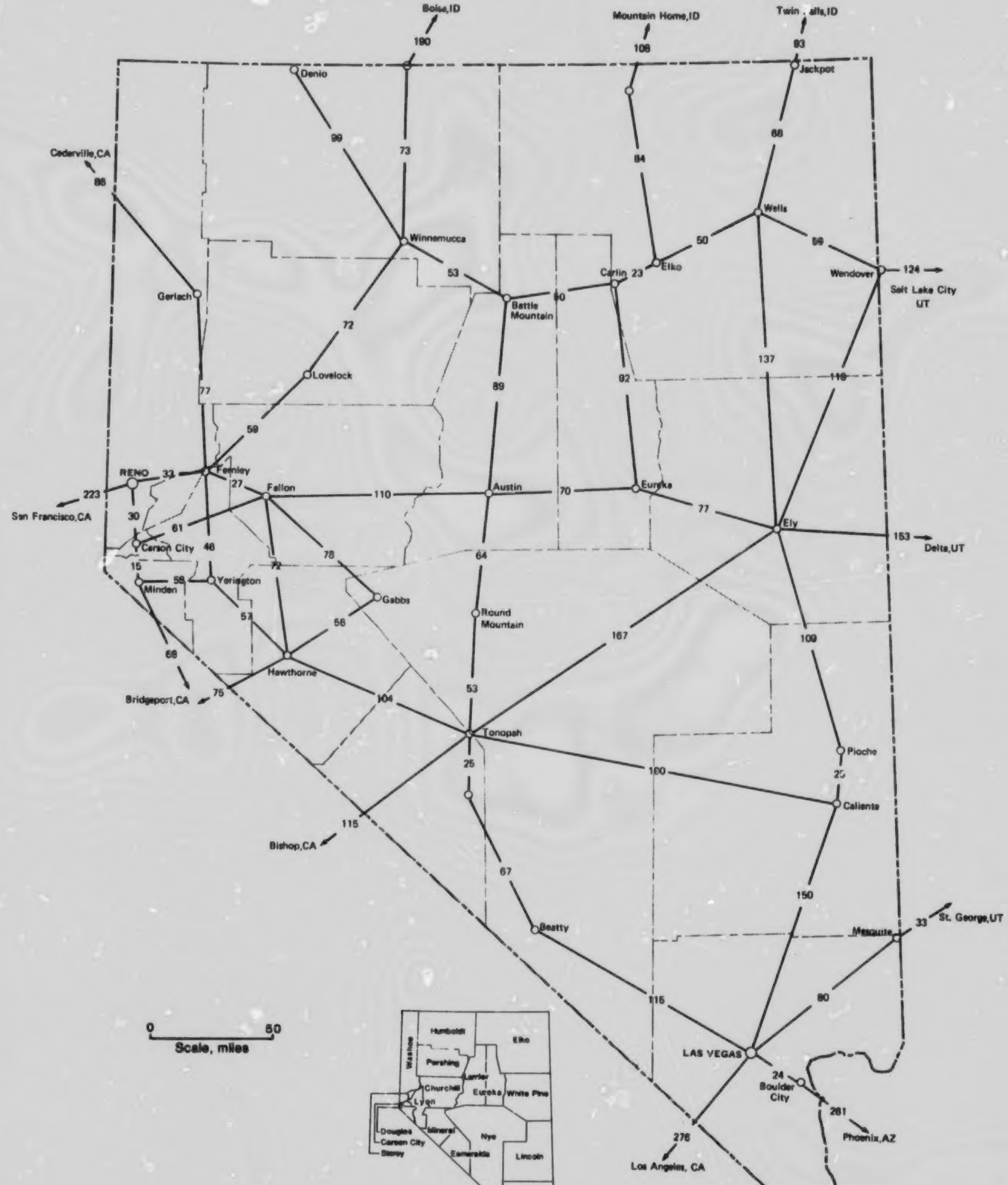
Boise,ID
190
Mountain Home,ID
106
Twin Falls,ID
83
Jackpot
Denio
99
73
84
68
Cedarville,CA
86
Wells
Winnemucca
50
Elko
56
Wendover
124
Salt Lake City
UT
Carlin
23
53
Battle
Mountain
60
Gerlach
72
137
118
92
Lovelock
89
77
59
RENO
33
Fernley
27
Fallon
110
Austin
70
Eureka
77
Ely
223
San Francisco,CA
30
61
Carson City
46
78
64
153
Delta,UT
15
Minden
58
Yerington
72
Gabbs
Round
Mountain
57
56
68
Hawthorne
167
109
Bridgeport,CA
75
104
53
Tonopah
25
180
Pioche
25
Caliente
115
Bishop,CA
67
150
Beatty
Mesquite
33
St. George,UT
115
80
LAS VEGAS
24
Boulder
City
281
Phoenix,AZ
276
Los Angeles, CA
0
50
Scale, miles
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 8.—Highway distances between principal Nevada communities.

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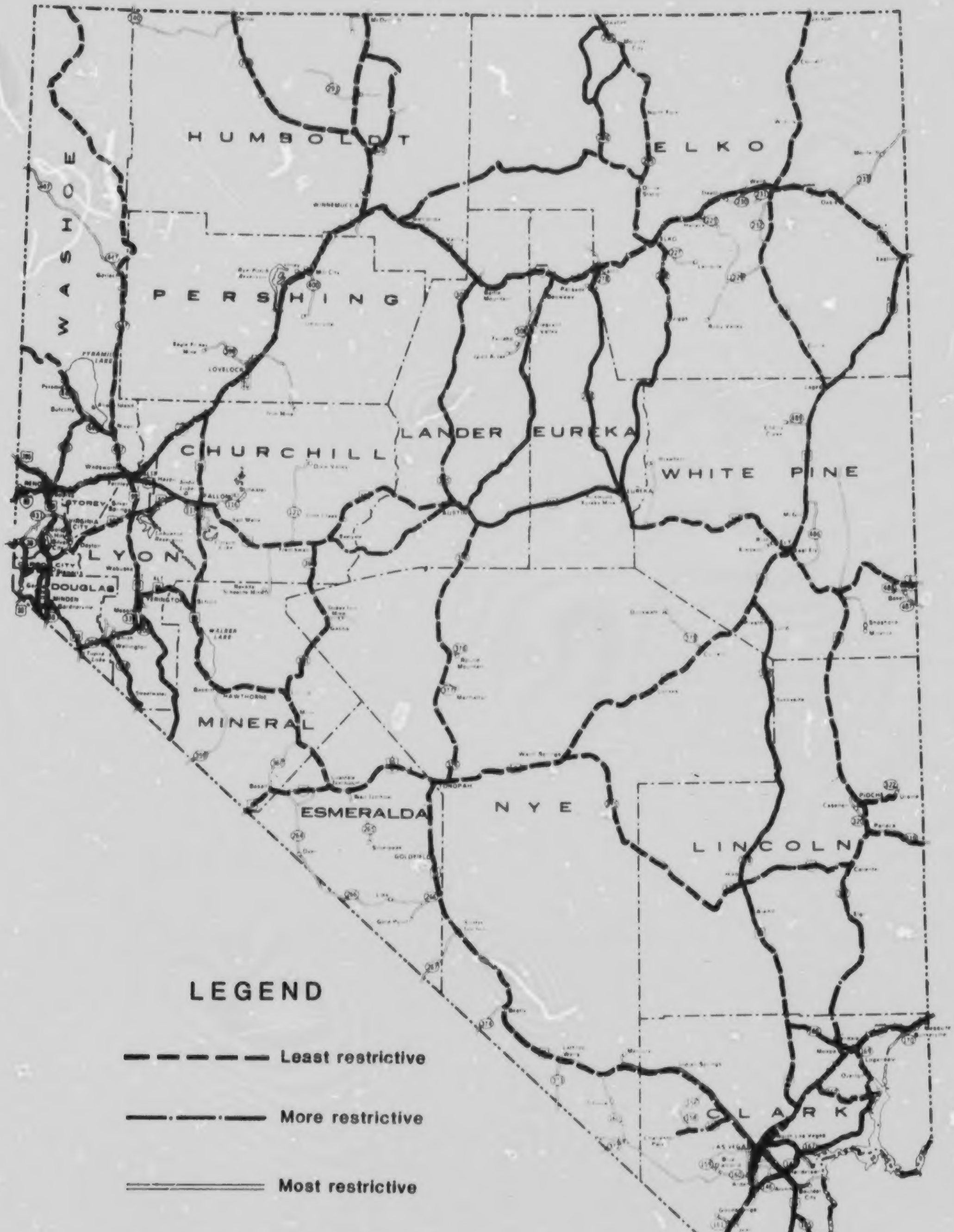
WASHOE
HUMBOLDT
ELKO
PERSHING
CHURCHILL
LANDER
EUREKA
WHITE PINE
STOREY
CARSON CITY
LYON
DOUGLAS
MINERAL
ESMERALDA
NYE
LINCOLN
CLARK
WINNEMUCCA
LOVELOCK
FALLON
HAWTHORNE
TONOPAH
GOLDFIELD
ELKO
LAS VEGAS
LEGEND
Least restrictive
More restrictive
Most restrictive
Most restrictive-critical; expect difficulty in obtaining State approval for haulage
0
50
Scale, miles

Figure 9.—Highway accessibility for transporting nonreducible loads above legal weight limits. (Base map, courtesy Nevada Department of Transportation.)

often transported to refineries by air from the State's major gold mines.

Because transportation can be a significant element in overall resource exploitation, mine operators attempt to keep their mine-to-mill or mine-to-market transportation costs as low as possible. Efforts have been made to persuade the State to increase the legal maximum weight limitations on State and county roads, or to grant special permits or waivers for continuous haulage of overweight loads. Because of potentially increased damage to road surfaces, State policy has not yielded in this area. However, the State does grant permits for single or one-way haulage of nonreducible overweight loads, such as might be encountered when delivering heavy mine and mill equipment to a minesite. In Nevada, approval to haul such loads is difficult to get during the spring months when the frost is thawing, and during periods when the subgrade lacks stability because of high moisture content.

REGULATION AND TAXATION

Mining is critically important to Nevada. Mining and mineral exploration are particularly vital to the economies of numerous small towns and cities, some of which are almost completely dependent upon the mining industry. The influence on the economies of the State's large cities is more indirect. The mining industry contributes substantially to the State's economy through jobs, taxes, freight revenues, and the support of satellite industries. Nevada mining regulations and taxation are generally favorable to the mineral industry (*107*) as the State recognizes the importance of a prosperous and stable mineral industry.

Mining Regulations

Most regulation governing development of Nevada mineral resources occurs at the State level: "Air quality control may be regulated at the county or municipal levels; solid waste management may be regulated at the county level; and zoning and special uses are regulated at the municipal level" (*731*).

A major portion of Nevada mining law deals with claim location, millsites, tunnel rights, claim disposition, partnerships, and licensing of equipment operators. The most restrictive State laws relate to mining safety and health, and air and water quality control. The State has adopted all mandatory Federal health and safety standards as published by MSHA, and the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor. The State Inspector of Mines, Division of Mine Inspection, State of Nevada Department of Industrial Relations is responsible for insuring industry compliance with mine safety regulations.

By State statute all water supply sources within the State, whether surface or underground, belong to the public, and their usage is regulated by the Division of Water Resources. Federal and State air and water quality laws are administered by the Nevada Division of Environmental Protection. The State air and water quality laws are generally no more stringent than Federal laws.

Nevada has no State clearinghouse or one-stop permit agency that serves to consolidate the permitting process within the State. Table 6 outlines State and Federal permits (and agency contacts) required during planning, development, and construction. The table is based on Nevada Bureau of Mines and Geology Special Publication L-6, *State and Federal Permits Required in Nevada Before Mining or Milling Can Begin* (rev. 1981), available from Nevada Bureau of Mines and Geology, Reno, NV 89557. The publication contains data compiled by the Nevada Department of Minerals (formerly State Division of Mineral Resources) on when permits are required, maximum and minimum times to obtain permits, permit costs, requirements for public notice, and other information required by the granting agency. Communication with the Nevada Department of Minerals (400 West King Street, Suite 106, Carson City, NV 89710, (702) 855-5050), is recommended for information regarding changes or additions to regulations and permitting procedures related to mining.

Similar information is available and explained in greater detail in *Permit Requirements for Development of Energy and Other Selected Natural Resources for the State of Nevada*, 1981, prepared for Four Corners Regional Commission and the U.S. Geological Survey (*731*). This document, available for several western States, is obtainable from U.S. Geological Survey, Environmental Affairs Office, 760 National Center, Reston, VA 22092.

Taxation (*18*)

Principal taxes paid by Nevada mining operations are taxes on net proceeds, property taxes on mine and mill equipment and improvements, and sales tax paid when purchasing equipment and supplies. Other taxes are levied on patented mine claims, and on oil-gas-geothermal leases.

The net-proceeds-of-mines tax is imposed on net earnings resulting from the sale of the product of the mining operation. The Nevada Department of Taxation is directed by State statute to determine the net proceeds of a mining operation from detailed financial data the mining company is required to submit. The net proceeds, which are subject to taxation, are based on gross yield or value of the product less allowable deductions for operating expenses. These deductions include, but are not limited to, actual costs for the following:

1. Extracting ore from the mines.
2. Transporting the mine product to the place of reduction, refining, or sale.
3. Reduction, refining, and sale.
4. Marketing and delivering the product and the conversion of the product into money.
5. Maintenance and repair of equipment and facilities.
6. Fire insurance.
7. Depreciation of the original capitalized cost of machinery, facilities, etc.
8. Mine development work.
9. Royalties.

The tax rate imposed upon the net proceeds earned from mining is equal to the ad valorem (property tax) rate set by the county assessor for other property within the same respective taxing jurisdiction.

Mining companies are also subject to a property tax assessed on mine and mill improvements and equipment. Property appraisal is conducted by the State Department of Taxation and is subject to the local jurisdiction tax rate set by the county assessor. Nevada's statutes limit the rate of the ad valorem property tax to a maximum of $3.64 for each $100 assessed valuation. Assessed value is set at 35% of the statutorily defined taxable value of the property. In turn, taxable value is based on the cost appraisal approach where value is determined by establishing the replacement

Table 6.—Permits required in Nevada before initiation of mining or milling (*200*)

Requirement	Granting agency or agency to contact
State:	
Permit to construct campsite	Nevada Division of Health, Bureau of Consumer Health Protection Services 505 East Xing St., Carson City, NV 89710 (702) 885–4750
Endangered wildlife	Nevada Department of Wildlife P.O. Box 10678 1100 Valley Road, Reno, NV 89520 (702) 784–6214
Endangered plants	Nevada Division of Forestry, Dept. of Conservation and Natural Resources 201 South Fall St., Carson City, NV 89710 (702) 885–4350
Air quality permit to construct	Nevada Division of Environmental Protection 201 South Fall St., Carson City, NV 89710 (702) 885–4670
Nevada water pollution control permit	Do.
Authorization for disposal of solid wastes	Do.
Air quality permit to operate	Do.
Hazardous waste	Do.
Permit to appropriate the public waters	Nevada Division of Water Resources 201 South Fall St., Carson City, NV 89710 (702) 885–4380
Permit to construct tailings dam	Do.
Opening and closing mines	State Inspector of Mines 1380 S. Curry St., Carson City, NV 89710 (702) 885–5243
Historic preservation	Nevada Division of Historic Preservation and Archaeology 201 South Fall St., Carson City, NV 89710 (702) 885–5138
Federal:	
Use of BLM-administered land	Bureau of Land Management—State Office Division of Mineral Resources 300 Booth St., P.O. Box 1200, Reno, NV 89520 (702) 784–5676
Use of BLM-administered land under wilderness review	Do.
Temporary use of BLM-administered land	Do.
Prevention of significant deterioration	Environmental Protection Agency Division of New Source Section, Air Management 215 Fremont St., San Francisco, CA 94105 (415) 974–8110
Right of way for transmission corridor	Bureau of Land Management Branch of Appraisal 300 Booth St., P.O. Box 1200, Reno, NV 89520 (702) 784–5474
Road access (ROW)	Do.
Purchase, transport, or storage of explosives	Bureau of Alcohol, Tobacco, and Firearms 350 South Center St., Reno, NV 89501 (702) 784–5251
Flora and fauna	U.S. Forest Service 1200 Franklin Way, Sparks, NV 89431 (702) 784–5331
Notification of commencement of operation	Mine Safety and Health Administration 3680 Grant Drive, Reno, NV 89509 (702) 784–5892
Patenting mining claims	Bureau of Land Management 300 Booth St., P.O. Box 1200, Reno, NV 89520 (702) 784–5751
City and County: General plan, building permit, special-use permit, zoning change, business license.	Contact respective city or county government affected by a proposed operation for information on what permits may be required.

costs, minus straight-line depreciation. The average Nevada ad valorem taxation per $100 of assessed value, as of August 1983, was $2.12. Current State statute limits annual growth in ad valorem revenue derived from old property in the aggregate to 4.5% without a vote of the people.

The third principal tax affecting mining companies is the sales and use tax. In 1981, the sales tax was increased statewide from 3.5% to 5.75%. Only Washoe County has a higher rate of 6%, imposed in November 1982.

For a comparative study of mine tax impact in Nevada and six western States, see reference 107.

MINERAL PROCESSING FACILITIES

Milling Facilities

Nevada beneficiation facilities are shown in figure 10 and listed in tables 7 and 8. Although the State has significant processing facilities for such commodities as diatomite, gypsum, limestone, salt, and colemanite, the facilities shown and listed are limited to those that process any of the 17 commodities designated in the introduction of this report. The State hosts primary beneficiation facilities for the processing of ores of antimony, barium, copper, gold, silver, lead-zinc, magnesium, mercury, molybdenum, tungsten, and lithium brines.

Much of the data given in figure 10 and tables 7 and 8 are from the directories of active Nevada mine operations compiled and published annually by the Division of Mine Inspection, Department of Industrial Relations, State of Nevada (*683, 685, 688*). Mill capacity and type of operation data were derived from journals, newspapers, and personal communication with the owners and operators. The figure and tables are not intended to be comprehensive; rather, the data are intended to show the 1983–84 status of strategic mineral process development within the State.

Over the past several years there has existed an excess of in-state milling capacity for copper, tungsten, and lead-zinc. This continuing trend through 1983 and into 1984 was caused, at least in part, by low commodity prices and related foreign competition. In 1983, the outward signs of a similar demise appeared for barite with many mines and/or mills producing at much reduced levels and some operations closing. Fluctuating market conditions tend to have a major impact on in-state lithium (lithium carbonate as the product), mercury, and molybdenum production because each of these commodities are produced by a single, "large" operation. Mill production from Nevada's lithium and mercury properties has been relatively stable in recent years; however, molybdenum (concentrate) production has fluctuated and at the end of 1983, following an 8-month shutdown, output remained less than capacity.

Activity in the State's precious metal industry has been robust in the past several years. Several milling facilities have operated at rates exceeding design capacity. Mill conversions from other commodity products to gold production have occurred. Expansion of existing gold processing facilities to greater capacities and the use of multiple processes are common. The precious metal industry, gold especially, is by far the largest segment of Nevada's current mining industry. Of the 389 large and small Nevada mining operations active in 1983, gold and silver operations comprised about 57%.

Smelting and Refining

Nevada hosts one smelting and one processing facility that have been available for custom processing of copper and tungsten concentrates. The Kennecott smelter at McGill processed copper concentrates prior to its closure in June 1983. Kennametal, Inc., Nevada Division, is solely dependent on custom tungsten concentrates for its operation located a short distance north of Fallon.

The Kennecott smelter, colocated with the company's 19,500 t/d (21,500 ton/d) flotation concentrator, has the capacity to produce 45,000 t/a (50,000 ton/yr) of blister copper. It has operated on an intermittent basis after the company's nearby Ruth Mine closed in 1978. Since then, the smelter has survived on stockpiled copper concentrates, and on custom concentrates processed for other copper companies or from Kennecott's other operations. The smelter closed because of the inability to obtain adequate concentrates. Kennecott plans to continue maintenance of the facilities in the event domestic copper industry conditions improve.

The Kennametal processing plant buys tungsten concentrates on the world market. As of early 1984, domestic concentrates were not being offered, and the plant's supply sources were from foreign suppliers only. The company purchased concentrates meeting normal tungsten specifications with 60% WO_3. Minimum amount accepted per shipment is 450 t (500 ton). Sulfur content above 1.5% is penalized (*734*).

Smelting facilities are common to Nevada's numerous gold operations. The facilities are captive and seldom consider smelting outside concentrates. Dore product is sent generally to east and west coast companies for refining.

Figure 11 shows and lists principal smelting and refining processing facilities in the immediate area significant to Nevada. The figure does not include the Battle Mountain area barite grinding facilities (fig. 10). Facilities listed in the figure either currently buy, or have in the past, bought custom concentrates. The figure lists a much smaller number of copper, lead, and zinc smelting-refining facilities than would have been included 15 yr ago. The closing of smelting and refinery facilities has added significantly to the distances companies, especially the smaller operations, must ship their concentrates for treatment (*734*). Even Nevada's largest operations, such as Anaconda Company's Nevada Moly Mine,[6] may have to ship concentrates great distances for smelting. As an example, the molybdenum concentrates from the molybdenum-copper mine have been shipped to roasting facilities in Iowa, Pennsylvania, Canada, and Europe.

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[6] Nevada Moly Mine indefinitely suspended operations in January 1985 because of poor market conditions.

Table 7.—Numerical index of selected beneficiation facilities in Nevada

(Refer to figure 10)

Map No.	Name	Commodity[1]
1..	McDermitt	Hg
2..	Oxbow Tungsten	W
3..	Dry Creek	$BaSO_4$
4..	Stormy Creek	$BaSO_4$
5..	Wells	W
6..	Enfield Bell (Jerritt Canyon).	Au
7..	Dexter	Au
8..	Esmeralda	Au
9..	Getchell	Au
10.	Pinson	Au
11.	Rossi	$BaSO_4$
12.	Dee	Au
13.	Bootstrap	Au
14.	Goldstrike	Au
15.	Bullion Monarch (Universal Gas of Montana).	Au
16.	Carlin	Au
17.	Eisenmann	$BaSO_4$
18.	Patsy Ann	$BaSO_4$
19.	Gold Quarry	Au
20.	Maggie Creek	Au
21.	Nevada Barth	Fe
22.	Dunphy	$BaSO_4$
23.	Argenta	$BaSO_4$
24.	Dresser	$BaSO_4$
25.	Battle Mountain Grinding (IMCO).	$BaSO_4$
26.	Battle Mountain Copper Basin.	Cu
27.	Battle Mountain Copper Canyon Precipitation plant.	Cu
28.	Battle Mountain Copper Canyon.	Au
29.	Independence	Ag
30.	Bateman Canyon	$BaSO_4$
31.	Fire Creek	Au
32.	Major Barite	Au
33.	Grey Eagle	Au
34.	Buckhorn	Au
35.	Cortez leach	Au
36.	Cortez	Au
37.	Greystone	$BaSO_4$
38.	Mountain Springs (IMCO)	$BaSO_4$
39.	Mountain Springs (FMC)	$BaSO_4$
40.	Jupiter	Au
41.	Fortune Cookie	Au
42.	Springer	W
43.	Lewis	Au
44.	Global	Au
45.	Imlay Canyon	Au
46.	Nevada Packard	Ag
47.	Oreana	Ag
48.	F. M. Wright	Au
49.	Relief Canyon	Au
50.	Gold Hill	Au
51.	Bernice Canyon	Sb
52.	Tungsten Mountain	W
53.	New Pass	Au
54.	Allen	$BaSO_4$
55.	Austin Resources	Ag
56.	Bullion Monarch (Monarch Mining).	Ag
57.	Bauer	Ag
58.	Precious Metals (Brazos, Imperial-Klondike).	Au
59.	Victorine (Sumich)	Au
60.	Silver Center-Wonder	Au
61.	Anchor Cox Canyon	Au
62.	Kennametal	W
63.	Fallon	$BaSO_4$
64.	John Young (Wheeler)	W
65.	Fisk	W
66.	Nevada Pacific	Au
67.	Gooseberry	Ag
68.	American Flat	Au
69.	Haywood-Santiago	Au
70.	Bennetts	Au
71.	Donovan	Au
72.	DeLaMare	Au
73.	Buckskin	Au
74.	Veta Grande	Au
75.	Bell Mountain	Au
76.	Nevada Scheelite	W
77.	Paymaster	Au
78.	Ione Placer	Au
79.	Luning	MgO
80.	Nevada Works	MgO
81.	Paradise Peak	Au
82.	Santa Fe	Au
83.	Kinkead	$BaSO_4$
84.	Borealis	Au
85.	Aurora	Au
86.	Ashby	Au
87.	New Boston	Au
88.	Red Rock	Au
89.	Aden	Au
90.	Potosi	Au
91.	Candelaria	Ag
92.	Argentum	Au
93.	G & S	Au
94.	Northumberland	Au
95.	East Northumberland	$BaSO_4$
96.	Round Mountain	Au
97.	Manhattan (Arizona Hillside Mining Co).	Au
98.	Manhattan (Tenneco)	Au
99.	Nevada Moly	Mo
100	Tonopah West (Miller's)	Au
101	Boss	Au
102	Jumbo	$BaSO_4$
103	Tonopah Divide	Au
104	Silver Peak	Li
105	Sixteen-to-One	Ag
106	Goldfield Tailings (Blackhawk).	Au
107	Goldfield (Trafalgar)	Au
108	Goldfield (Southern Pacific, Noranda, P.G. & U).	Au
109	Spicer Mining Co., Inc.	Au
110	Montgomery Shoshone	Au
111	Sterling	Au
112	Victoria	Cu
113	Bald Mountain	Au
114	Alligator Ridge	Au
115	Windfall	Au
116	McGill Smelter	Cu
117	McGill Concentrator	Cu
118	Sunshine Puritan	Cu
119	Ward	Pb-Zn
120	Taylor	Ag
121	Atlanta	Au
122	Research Silver (Silver Horn).	Au
123	Pioche	Au
124	Caselton	Pb-Zn
125	Emerson	W
126	Mockingbird	Au
127	Continental	Au
128	Oro De Mojave	Cu
129	Jetco	Au

[1] Principal commodity.

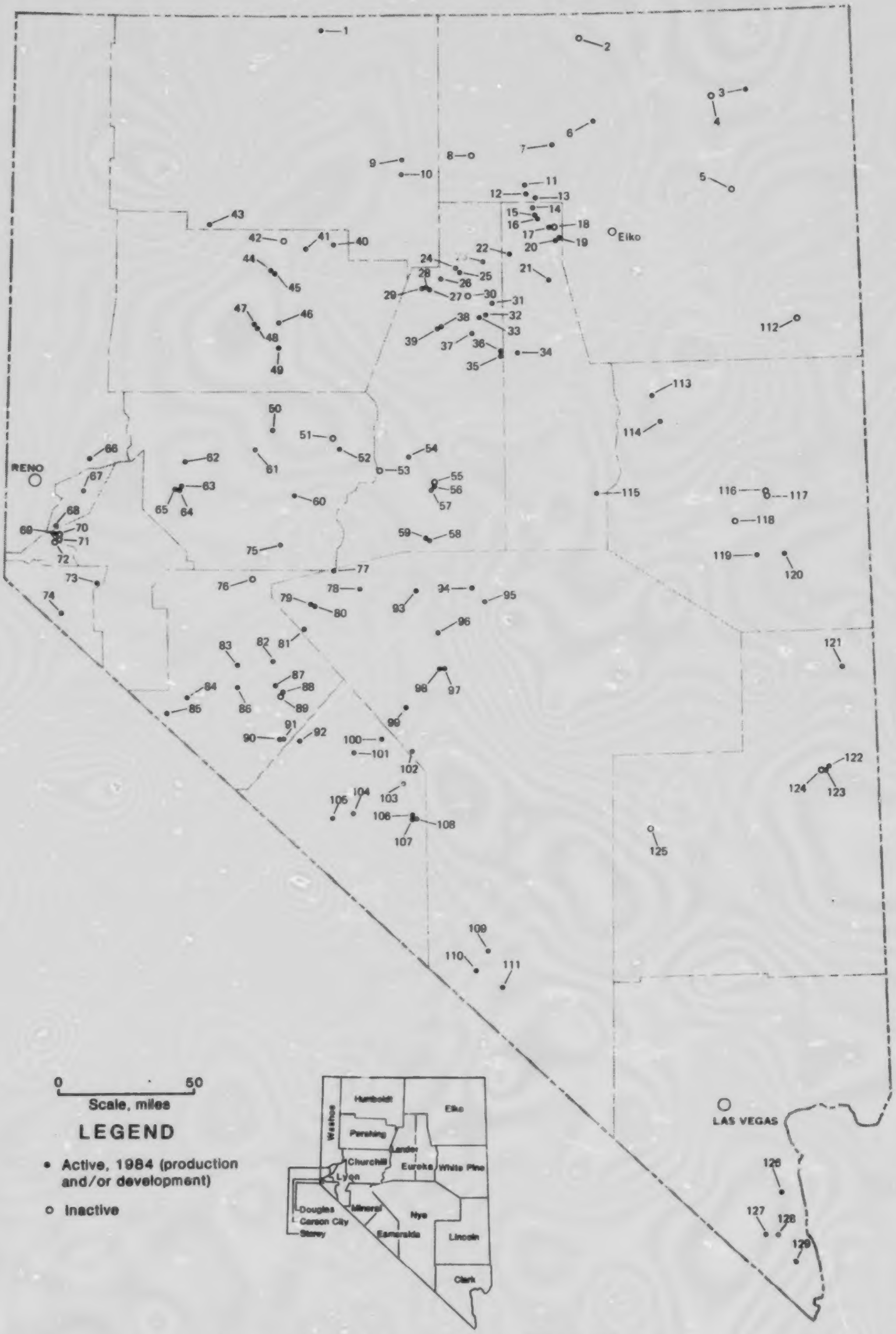
RENO
Elko
LAS VEGAS
0
50
Scale, miles
LEGEND
• Active, 1984 (production and/or development)
o Inactive
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 10.—Selected beneficiation facilities in Nevada.

	NAME	COMPANY	TYPE	STATUS
1	Trail plant, B.C.	COMINCO, Ltd.	A	a
2	Tacoma plant	ASARCO, Inc.	A	a
3	Bunker Hill	Bunker Ltd. Part.	AB	b
4	Kellogg plant	Sunshine Mining Co.	B	c
5	East Helena plant	ASARCO, Inc.	A	a¹
6	Salt Lake City plant	Johnson-Matthey	B	c
7	Geneva plant, Provo	U.S. Steel Corp.	A	a
8	Mc Gill	Kennecott	A	b
9	Fallon plant	Kennametal	C	a
10	Pine Creek plant	Union Carbide	C	b
11	Los Angeles plant	Engelhard	B	a
12	Miami plant	Inspiration Consolidation	A B	a
13	Hayden plant	ASARCO, Inc.	A	a
14	Douglas plant	Phelps Dodge	A	a
15	El Paso plant	ASARCO, Inc.	A	a
16	Amarillo plant	ASARCO, Inc.	B	a
17	Corpus Christi plant	ASARCO, Inc.	B	b,a

Type: A, smelter; B, refinery; C, chemical
Status: a, active; b, idle; c, under construction or expansion

¹Closure planned in spring 1985

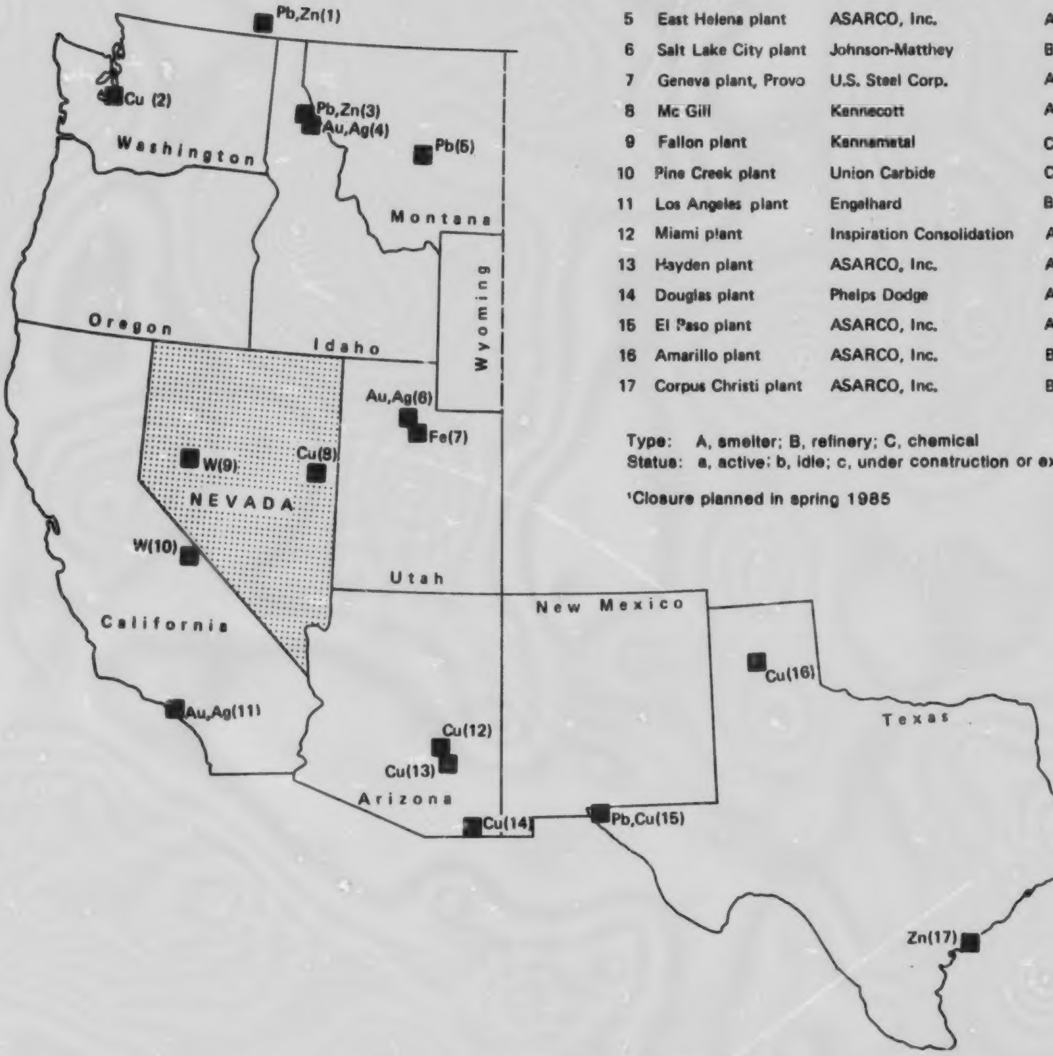
Pb,Zn(1)
Cu (2)
Washington
Pb,Zn(3)
Au,Ag(4)
Pb(5)
Montana
Wyoming
Oregon
Idaho
Au,Ag(6)
Fe(7)
W(9)
Cu(8)
NEVADA
W(10)
Utah
California
New Mexico
Cu(16)
Texas
Au,Ag(11)
Cu(12)
Cu(13)
Arizona
Cu(14)
Pb,Cu(15)
Zn(17)

Figure 11.—Regional secondary processing facilities significant to Nevada.

Table 8.—Selected beneficiation facilities in Nevada

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
ANTIMONY							
Bernice Canyon; Howard Turley.	Churchill	Idle	51	Mill, screen	1.8 t/h	A	Capacity is ball mill capacity. Owner hopes to operate the mill in 1985 with possible addition of flotation circuit. The mine was operational in 1984. Ore contains Au, Ag.
BARITE							
Allen; Tom Norris Mining Co.	Lander	Active	54	Mill, gravity (jig).	36 t/h	A	Produces about 18 t/h product. Equipment comprised of 1 roll crusher and 1 jig.
Argenta; Milchem, Inc.	do	do	23	Mill, gravity, grind.	136 t/h crush, 16.4 t/h grind.	A, B	Reportedly operating at 55% to 60% of capacity; has accepted custom in the past.
Bateman Canyon; Milchem, Inc.	do	Idle	30	Mill, gravity (jig).	54 t/h	A, B	Custom work accepted in past and will consider custom in future.
Battle Mountain Grinding; Imco Services, Inc.	do	Active	25	Mill, grind, classification.	360 t/d, 27 t/h	A, B	127,000-t/a capacity. 3 grinding mills, 9-t/h capacity each.
Dresser (Battle Mountain); Dresser Minerals.	do	do	24	Mill, crush, grind.	32 t/h, total grind.	A, B	Grinding plant; 3 roller mills. Reported operating at about 60% capacity in early 1983. Would consider taking custom ore if spare capacity exists.
Dry Creek; Chromalloy Mining and Minerals (owner), leased by Circle A Construction.	Elko	do	3	Mill, gravity (jig).	180 to 230 t/h	A	Capacity is jaw crusher.
Dunphy; N. L. Industries, Baroid Division.	Eureka	do	22	Mill, gravity, flotation, grind.	110 t/h	A, B	Have done and would consider custom grinding, not flotation; 73-t/h railcar loading capacity.
East Northumberland; All Minerals, Inc.	Nye	do	95	Mill, gravity	1,365 t/d, 90 t/h	A, B	Portable crusher; peak load for crushing circuit is 136 t/h.
Eisenmann; Eisenmann Chemical Co.	Eureka	do	17	Mill, crush, jig.	272,000 t/a	A, B	Possesses 2 jigs; has done custom crushing and would consider custom jigging. In 1984, mill feed was stockpiled ore from its Lakes Mine.
Fallon; Standard Slag Co.	Churchill	do	63	Mill, flotation	7.3 t/h product	A, B	Formerly a fluorspar mill, bought to feed P & S barite mine ore.
Greystone; Dresser Minerals.	Lander	do	37	Mill, gravity (jig).	110 t/h estimated product.	A	Mill is portable; capable of producing 907,000-t/a product.
Jumbo; GEO Drilling Fluids, Inc.	Nye	do	102	Mill, crush, screen.	272 t/h	A	Active in 1983; status unknown in 1984.
Kinkead; Kinkead Mining and Construction.	Mineral	do	83	do	23 t/h	A	Mill has flotation capability; intermittent operation. Jig capacity—14 t/h. Normally operates at 90 t/d.
Mountain Springs (FMC); FMC Corp.	Lander	do	39	Mill, crush, screen.	63,000 t/a	A	Primary crusher design capacity is about 181 t/h.
Mountain Springs (IMCO); Imco Services, Inc.	do	do	38	Mill, jig, table, flotation.	400,000 t/a. 127,000 t/a ground product.	A	
Patsy Ann; Unichem Minerals, Inc.	Eureka	Idle	18	Gravity (jig)	30 to 34 t/h	A	2 jigs. New equipment operated about 2 months in 1983; no crusher. Product capacity is 10.9 t/jig; jigs processed Coyote Mine ore.
Rossi; Tom Norris, Inc. (contractor).	Elko	Active	11	Mill, gravity	108 t/h	A	Minesite portable 2-stage crushing with 2 jigs; produces about 907 t product over 14 h/d. Product goes to Dunphy plant.
Stormy Creek; Old Soldier Minerals.	do	do	4	Mill, screen, gravity (jig).	272 t/h crush, 109 t/h jig.	A, B	Operated partial year of 1983; idle in 1984. Will consider custom milling.

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
				COPPER			
Battle Mountain Copper Basin (Electrolytic Plant); Duval Corp.	Lander	Active	26	Solvent extraction, electrowinning.	5,170 t/a	A	Capacity is annual cathode capacity. Closed indefinitely in December 1984.
Battle Mountain Copper Canyon Precipitation Plant; Duval Corp.	do	do	27	Leach-precipitation.	1,562-t/a product (at peak).	A	Capacity in terms of year's output. Plant treats leach solutions from Copper Canyon Mine dumps. 1984 estimated production is at levels of 50% to 70% of peak production capacity.
McGill Concentrator; Kennecott Minerals Co.	White Pine	Idle	117	Mill, flotation	19,500 t/d	A, B	Located adjacent to McGill smelter.
McGill Smelter; Kennecott Minerals Co.	do	Idle, standby.	116	Smelter	45,000-t/a product.	B	Product is blister Cu. Processed Kennecott's Robinson district concentrate through 1978.
Oro De Mojave; Quadra Mining & Development.	Clark	Active	128	Mill, flotation, jigging, CCD-Merrill-Crowe precipitation.	73 t/h	A	Production began in 1984. Also recovers Pb, Ag, and Au.
Sunshine Puritan; Kennecott Minerals Co.	White Pine	Idle	118	Leach-precipitation.	<200-t/month product.	A	Production from unit greatly reduced when mining at the Ruth open pit copper mine ceased in 1978. Very small amount of production to February 1983.
Victoria; Hecla Mining Co.	Elko	do	112	Mill, flotation	907 t/d	A	Intermittent operation.
				GOLD AND/OR SILVER			
Aden; Hugh C. Ingle	Mineral	Idle	89	Mill, gravity, flotation.	<15 t/d	A, B	Has done custom in the past.
Alligator Ridge; Amselco Minerals, Inc.	White Pine	Active	114	Mill, heap leach,cyanidation.	2, 700 t/d	A	Recovers Au with byproduct Ag and Hg.
American Flat; United Mining Co. of Nevada, Inc.	Storey	do	68	Mill, cyanidation.	907 t/d	A, B	Operating at capacity in 1984.
Anchor Cox Canyon; Anchor Mine, Inc.	Churchill	do	61	Vat leach, cyanidation.	72 t over 3- to 4-d period.	A	No crushing facilities by December 1984, though operators reportedly are in search of a crusher.
Argentum: Combined Metals & Recovery Systems.	Esmeralda	do	92	Mill, cyanidation (flotation).	360 t/d	A, B	Capacity is crushing ability for flotation circuit. On standby in 1984. Will buy ore.
Ashby; Hugh C. Ingle, Jr.	Mineral	do	86	Mill, heap leach, cyanidation.	<10 t/d	A	Capacity is estimated.
Atlanta; Standard Slag Co.	Lincoln	do	121	Mill, cyanidation.	520 t/d	A, B	Has taken custom in past.
Aurora; Centennial Exploration Corp.	Mineral	do	85	Mill, heap leach, cyanidation.	900 t/d	A	Cone crusher capacity 91 t/h; jaw crusher capacity 136 t/h.
Austin Resources; Austin Resources Corp.	Lander	Idle	55	Mill, flotation	68 t/d	A	Mill is intact and has processed Ag ore only.
Bald Mountain; Placer U.S.	White Pine	Active	113	Mill, heap leach, cyanidation.	57 L/s (900 gal/min).	A	Recovers primarily Au. Full production will be reached about January 1985. Capacity is for carbon reccovery plant.
Battle Mountain Copper Canyon; Duval Corp.	Lander	Active, development.	28	Mill, cyanidation, gravity.	3,200 to 3,600 t/d.	A	Expansion to unknown capacity planned for 1983 completion. Crusher rated capacity 726 t/h.
Bauer; Bauer Metals, Inc.	do	Active	57	Mill, agglomeration, heap leach, cyanidation.	907 t/d	A	Operation leaches tailings. Primarily extracts Ag, byproduct Au. Commenced production in 1983; full production in 1984.
Bell Mountain; Bell Mountain Mining Co.	Churchill	Development.	75	Mill, cyanidation (tank).	650 t/d	A	Capacity is 1982 preliminary.

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
GOLD AND/OR SILVER—Continued							
Bennetts; John Bennett (owner).	Lyon	Idle	70	Mill, cyanidation.	32 t/d	B	Type questionable. Reportedly inactive since about 1942. Major components still present.
Bootstrap; Carlin Gold Mining Co.	Elko	Active	13	Heap leach, cyanidation.	200,000 t/a	A	Recovers Au only. Dump leach. On-site plant consists of a 4-stage carbon column circuit. The gold-loaded carbon is stripped, acid washed, and regenerated at the Carlin mill.
Borealis; Tenneco Minerals Co.	Mineral	do	84	Mill, heap leach, crush, screen.	2,270 t/d	A	Recovers Hg also. Crushing circuit capacity 272 t/h; Hg retort feed 0.9 t/8-h d; smelting furnace feed 0.9 t/8-h d.
Boss; Falcon Mining and Exploration Co.	Esmeralda	Active, development.	101	Mill, heap leach, cyanidation.	180 t/h	A, B	Production anticipated to commence fall 1984. Crusher moved from Tonopah Divide Mine. Will consider buying compatible ore.
Buckhorn; Cominco American, Inc.	Eureka	Active	34	Mill, heap leach, cyanidation.	260 t/h crush	A	Heaps to be built at 2,270 t/d ore, or 680,000 t/a.
Buckskin; Pacific Silver Corp.	Douglas	Development.	73	Mill	270 t/d	A	
Bullion Monarch; Monarch Mining.	Lander	Active	56	Mill, flotation	450 to 540 t/d	A, B	Recovers Ag. Will buy high-grade compatible to circuit; minimum lot 450 t. 1-t/h (24-h/d) smelter near completion.
Bullion Monarch; Universal Gas of Montana.	Eureka	do	15	Mill, cyanidation.	360 t/d	A	Normal feed rate about 180 t/d.
Candelaria; NERCO Metals.	Mineral	do	91	Crush, screen, heap leach, cyanidation.	7,300 t/d	A	Primarily produces Ag.
Carlin; Carlin Gold Mining Co.	Eureka	do	16	Mill, cyanidation.	2,450 t/d	A	Recovers Hg also. Capacity is combined 2,000 t/d oxide and 450 t/d carbonaceous ore capacities.
Continental; Continental Co.	Clark	Inactive	127	Heap leach, cyanidation.	See comments	A	Became inactive in 1984. Has two 4,500-t leach ponds. Zn precipitation.
Cortez Leach; Cortez Gold Mines.	Lander	Active	35	Heap leach, cyanidation.	57 L/s (900 gal/min).	A	Capacity is carbon-in-pulp plant.
Cortez; Cortez Gold Mines.	do	do	36	Mill, carbon-in-leach tanks and carbon columns, cyanidation.	1,800 t/d, >180 t/h.	A	Processes ore from Horse Canyon Mine. Capacity is planned feed rate (660,000 t/a).
Dee; Dee Gold Mining Co.	Elko	do	12	Mill, cyanidation.	820 t/d, 286 t/h.	A	Operation began in fall 1984.
DeLaMare; R. W. DeLaMare (owner).	Lyon	Idle	72	do	45 t/d	B	Type questionable. Reportedly inactive since about 1942. Major components still present.
Dexter; Pecos Resources.	Elko	Active, development.	7	Heap leach, cyanidation, Merrill-Crowe precious metal plant recovery.	16 L/s (250 gal/min).	A	Test heap leaching began in 1984. Capacity is Merrill-Crowe plant purchased from Tuscaroa Associates.
Donovan; Mike Donovan (owner).	Lyon	Idle	71	Mill, cyanidation.	45 t/d	B	Type questionable. Reportedly inactive since 1879. Major components still present.
Enfield Bell (Jerritt Canyon); Freeport Gold Co.	Elko	Active	6	do	3,040 t/d	A	Original capacity was 2,750 t/d in 1981.
Esmeralda; Merrill A. Nelson (owner).	do	Idle	8	Mill, crush, grind, gravity (table).	23 t/d	A	Last period of mill operation was for a short period in 1981.

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
GOLD AND/OR SILVER—Continued							
F. M. Wright; F. M. Wright Mining Co.	Pershing	Active	48	Mill, flotation, gravity.	45 t/d	B	Has run as captive mill. Presently processes precious metals. Has processed base metal sulfides and tungsten.
Fire Creek; Mines Resources, Inc.	Lander	do	31	Heap leach, cyanidation, carbon column recovery.	30,400 t per 60-d period batch process.	A	
Fortune Cookie; Proquip, Inc.	Pershing	Active, production, development.	41	Placer, gravity.	1,500 to 2,300 m^3/shift (2,000 to 3,000 yd^3/shift). See comments.	A	Feasibility and expansion to 4,600 to 7,600 m^3 (6,000 to 10,000 yd^3) on a 1-shift basis planned for 1985.
G & S; Robert E. Wilson.	Nye	Active	93	Mill, gravity	18 t/d	A, B	Capacity estimated. Past product was tungsten.
Getchell; Watterson Mining, Contractor.	Humboldt	Development, feasibility.	9	Mill, cyanidation.	91 t/d	A	1983 activity was test leaching.
Global; Global Natural Resources, Inc.	Pershing	Active	44	Placer washing plant, trommel screen and sluice boxes.	60 m^3/h (80 yd^3/h)	A	
Gold Hill; Fisk and Robertson Mining.	Churchill	do	50	Mill, vat leach, cyanidation, activated carbon.	1,360 t/month	A	
Gold Quarry; Carlin Gold Mining Co.	Eureka	Development.	19	Heap leach; mill agitated leach, carbon-in-pulp.	6,120 t/d	A	Will recover byproduct Hg. Mill to come on-stream in late 1985, processing about 2.3 million t/a ore.
Goldfield; Trafalgar Mines partnership.	Esmeralda	Active	107	Agglomeration, heap leach, cyanidation.	See comments	A	Operation reportedly shut down in 1984 with equipment still on-site. Plan was to reprocess 91 million t mill tailings. Reportedly, only 27,000 to 36,000 t material placed on heap.
Goldfield (Southern Pacific, Noranda, P.G. & U. joint venture); Blackhawk Mines Corp. (operator).	do	Development.	108	do	1,090 t/d	A	Information in December 1984 indicated the development plan may have been abandoned.
Goldfield Tailings; Blackhawk Mines Corp.	do	Active	106	do	23,000 t/a	A	
Goldstrike; Western States Minerals Corp.	Eureka	do	14	Cyanide heap leach of mine-run ore.	1,500,000 m^3 (2,000,000 yd^3/a) material handled.	A, B	Does no custom but may consider it if ore is compatible. Annual tonnage ore and waste estimated 3.6 million t.
Gooseberry; Asamera Minerals (U.S.), Inc.	Storey	do	67	Mill, cyanidation.	320 t/d	A	Principal commodity is Ag. Full production reached in fall 1984.
Grey Eagle; Grey Eagle Mining Co.	Lander	do	33	Mill, crush, gravity.	45 t/d	A	
Haywood-Santiago; NEVEX Gold Co., Inc.	Lyon	Development.	69	Mill, heap leach, cyanidation.	15.8 L/s pregnant solution.	A, B	Will consider buying ore after 1 yr of production. Production anticipated to commence in November 1984. Full production anticipated to commence in first quarter 1985.
Imlay Canyon; Bill Dale.	Pershing	Active	45	Placer washing plant; trommel screen and sluice boxes.	15- to 19-m^3/h (20- to 25-yd^3/h) test capacity.	A	Recovers Au, W, and Hg. Placer operation. Capacity will be increased in 1985 from stated test capacity.

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
GOLD AND/OR SILVER—Continued							
Independence; United Mining and Milling.	Lander	Active ...	29	Mill, cyanide vat leach.	45 t/d	A, B	Principal commodity is Ag, byproduct Au. Will consider custom. Mill burned and rebuilt in 1983. Operating less than capacity in 1984.
Ione Placer; Marshall Earth Resources, Inc.	Nye	...do...	78	Mill, screen, gravity.	270 t/h	A	Ore comes from their Ione Placer and Sky Claims.
Jetco; Jetco Enterprises, Inc.	Clark	...do...	129	Mill, tank leach	NA	A, B	May take custom. Has 25- by 91-cm (10- by 36-in) jaw crusher and 1.2- by 1.5-m (4- by 5-ft) ball mill.
Jupiter; Circle A Construction.	Pershing ...	...do...	40	Mill, char-in-pulp, cyanidation.	1.4 t/h..........	A	
Lewis; Standard Slag Co.	Humboldt ..	...do...	43	Mill, heap leach	3,200 t/d........	A	Production began in August 1984.
Maggie Creek; Carlin Gold Mining Co.	Eureka	...do...	20	Heap leach, cyanidation.	2,300 t/d........	A	Milling grade is trucked and processed at Carlin mill.
Major Barite; Major Barite Co.	Lander	...do...	32	Mill, gravity ...	90 t/h	A, B	Formerly called the Bradshaw (processed barite).
Manhattan; Arizona Hillside Mining Co.	Nye	Active, standby.	97	Heap leach, cyanidation.	NA	A	Mine capacity is about 2,720 t/d. No crushing facilities.
Manhattan; Tenneco Minerals Co.	....do....	...do...	98	Mill, gravity, flotation, cyanidation.	2,700 t/d crush, 1,360 t/d flotation.	A	Plant startup in January 1984.
Mockingbird; P.G. Harrison and James Harris.	Clark	...do...	126	Mill, gravity ...	2 t/d	A	Has accepted custom but does not at present; intermittently active.
Montgomery Shoshone; Bullfrog Mining Enterprises.	Nye	...do...	110	Mill, screen, crush, vat leach.	450 t/d crush	A, B	Possesses two 680-t vats; intermittently active.
Nevada Pacific; Nevada Pacific Mining Co.	Washoe ...	Development.	66	Gravity, jigs, tables.	1,500 m³/d (2,000 yd³/d).	A	Construction in progress in December 1984 on mine and mill to process a 1.5 million m³ (6 million yd³) eluvial gold deposit.
Nevada Packard; Nevada Packard (joint venture).	Pershing ...	Active ...	46	Heap leach, cyanidation, Zn dust precipitation.	200 gal/min	A	Recovers primarily Ag. 140-t/h capacity crusher. Sold in 1984. Production ceased in July 1984. Possesses 3 Shriver clarifier presses and 2 precipitation presses.
New Boston; New Boston Mining Co.	Mineral	...do...	87	Mill, screen, heap leach.	150 t/h	A, B	Cyanidation.
New Pass; Donald Jung.	Lander	Idle	53	Mill, heap leach, cyanidation.	36 t/d	A	Capacity is approximate.
Northumberland; Cyprus Mines Corp.	Nye	Active ...	94	..... do	4,500 t/d........	A	
Oreana; Coronado Oil & Minerals Co.	Pershing ...	...do...	47	Mill, flotation, gravity.	90 t/d (has never operated over 45 t/d).	A, B	Has processed Au, Sb, W. Minor production early 1983; none in 1984. Production anticipated commencing again in first quarter 1985.
Paradise Peak; FMC Corp.	Nye	Active, development.	81	Mill, cyanidation, agitation, leaching.	907,000 t/a......	A	Proposed capacity is estimated. Hg will be produced as byproduct. Production planned to commence in 1986.
Paymaster; Jesse R. Wilson.	....do....	Active ...	77	Mill, tank cyanide leach, carbon recovery.	90 t/d	A	Capacity is tank capacity. Ag recovery very minor.
Pinson; Pinson Mining Co.	Humboldt ..	...do...	10	Mill, carbon-in-pulp, cyanidation.	1,360 t/d........	A	Recovers byproduct Hg. In 1984, about 25% of ore mined was heap leached.

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
GOLD AND/OR SILVER—Continued							
Pioche; Hollingshead Mining Contracting.	Lincoln	Active	123	Mill, flotation, gravity.	23 t/d	A, B	Some custom work has been done.
Potosi; S & R Mining & Milling.	Mineral	do	90	Crush, screen, heap leach, cyanidation.	230 t/d	A	Portable crusher.
Precious Metals (Brazos, Imperial-Klondike); Precious Metals, Inc. of Texas.	Lander	Inactive	58	Mill, flotation	180 t/d	A	Anticipated restart of production in early 1984. Reportedly bought in late 1984 by Spirit Oil Co., Billings, MT.
Red Rock; Tseng Mining Co.	Mineral	Active	88	Mill, pond leach, screen.	90 t/hr	B	Leases Ladd Enterprise mill. Has unused flotation capability. Ladd has about 180-t/h crushing capacity.
Relief Canyon; Lacana Mining, Inc.	Pershing	do	49	Mill, heap leach, cyanidation.	4,500 t/d, 907,000 t/a.	A	300-t/h design crushing capacity. Average annual product to be 680 kg (22,000 tr oz) Au.
Research Silver (Silver Horn); Silver Horn Research Mill Corp.	Lincoln	do	122	Mill, flotation, cyanidation.	320 t/d	A, B	
Round Mountain; Smoky Valley Mining Co.	Nye	do	96	Mill, heap leach, cyanidation.	9,000 t/d	A	Construction of a 36,000-t/d-capacity mill is being considered in 1984 for possible operation in 1987.
Santa Fe; Lacana Mining Corp.	Mineral	Development.	82	do	See comments	A	Production planned by December 1985 at minimum ore throughput of 590,000 t/a.
Silver Center-Wonder; Belmont Resources.	Churchill	Active	60	do	5,400 t/wk, 136 t/h.	A	Processes Wonder Mine tailings and Silver Center Mine new ore. Capacity is March 1984 process rate.
Sixteen-to-One; Sunshine Mining Co.	Esmeralda	do	105	Mill, tank leach	635 t/d	A, B	Has bought compatible ore. Crushing capacity about 130 t/h. Principal commodity is Ag.
Spicer Mining Co., Inc.; Nevada Mines & Minerals, Spicer Mining Co., Inc.	Nye	do	109	Mill, agglomeration, heap leach.	70- to 90-t/d pilot crushing.	A, B	Active in 1984. Also performs custom assay. Processes captive ore from Mayflower Mine. Agglomeration capacity 230 t/d; test mill 23 t/d; carbon stripping 340 kg/batch.
Sterling; Saga Exploration Co.	do	do	111	Mill, heap leach, cyanidation.	82 t/h	A	Projected daily crushing rate is 270 t.
Taylor; Silver King Mines, Inc.	White Pine	do	120	Mill, cyanidation.	1,800 t/d, 91 t/h	A, B	Recovers primarily Ag. Has accepted custom. Normal operating rate is 1,090 t/d.
Tonopah Divide; Ebco Enterprises.	Esmeralda	do	103	Mill, crush, screen, heap.	910 t/d, 180 t/h	A	Production expected to cease fall 1984. Crusher will be moved to company's Boss Mine.
Tonopah West (Miller's); TW-MNR Assoc.	do	do	100	Mill, tank leach	1,090 t/d	A	Recovers principally Ag with minor Au. Reprocesses old tailings in Tonopah district. Operations were suspended in July 1984 for an indefinite period.
Veta Grande; 20th Century Energy Corp.	Douglas	do	74	Mill, gravity, flotation.	180 t/d, 36 t/h	A, B	Intermittent operation.
Victorine (Sumich); New Beginnings Resources.	Lander	Active, development.	59	Mill, jig, flotation, cyanide regrind, electrowinning (Ag), smelting.	320 t/d	A, B	Capacity is current crusher capacity; design capacity is 450 t/d. Production to begin in mid-December 1984. Company will consider custom.
Windfall; Windfall Venture.	Eureka	Active	115	Cyanidation, heap leach.	1,100 t/d	A	Inactive most of 1983.

See explanatory notes at end of table.

Table 8.—Selected beneficiation facilities in Nevada—Continued

Name and operator	County	Status	Map No.[1]	Method	Capacity[2]	Type	Comments
				IRON			
Nevada Barth; Nevada Barth Corp.	Eureka	Active ...	21	Mill, crush, screen.	200 to 300 t/h ...	A	Feed is from stockpiles. Normal operating rate is 455 t/d.
				LEAD—ZINC			
Caselton; Combined Metals Reduction Co.	Lincoln	Idle	124	Flotation	1,270 t/d	A, B	Idle since about 1978. Plans in 1984 are to reopen by 1986. Will be looking for ore to purchase.
Ward; Silver Kings Mines, Inc.	....do....	Development, design.	119	Mill, flotation ..	1,100 t/d		Construction planned to begin in 1985 with completion in late 1986. Will recover Ag and Cu also. Design will allow for increase in capacity to 1,800 to 2,700 t/d.
				LITHIUM			
Silver Peak; Foote Mineral.	Esmeralda .	Active ...	104	Solar evaporation, chemical, refinery.	7,260 t/a	A	Capacity in terms of production. Product is lithium carbonate (Li_2CO_3).
				MAGNESIUM (MAGNESITE—MgO)			
Luning; C-E Basic	Nye	Active ...	79	Mill, screen ...	NA		
Nevada Works; C-E Basic.	....do....	...do...	80	Mill, calcine, flotation.	2,000 t/d	A	Capacity is estimated.
				MERCURY			
McDermitt; McDermitt Mine Joint Venture.	Humboldt .	Active ...	1	Mill, flotation, distillation.	2,200 t/d flotation; 0.45-t/h furnace.	A	Product is elemental Hg.
				MOLYBDENUM			
Nevada Moly; Anaconda Minerals Co.	Nye	Active ...	99	Mill, flotation, tank leach.	20,000 t/d	A	Also recovers Cu. Product is MoS_2.
				TUNGSTEN			
Emerson; Union Carbide Corp.	Lincoln	Idle	125	Mill, flotation ..	907 t/d	A	Mill intact and on standby.
Fisk; Gee Mines	Churchill ...	Active ...	65	Mill, gravity ...	0.9 t/h	A	Mill leased to Gee Mines, which ran Ag ore through it in 1984. Originally built to process tungsten ore.
John Young (Wheeler); John Young (owner).	....do....	...do...	64	Mill, gravity, amalgamation.	0.45 t/h	A, B	Also recovers Au. Idle in 1984. Has accepted custom and will consider custom in the future.
Kennametal; Kennametal, Inc.	....do....	...do...	62	Chemical	Proprietary data ..	B	A secondary processing plant, refinery.
Nevada Scheelite; Natural Resources Development, Inc.	Mineral	Idle	76	Gravity	113 t/d, 36 t/h ...	A	36-t/h jaw crusher capacity. In 1984, mill being dismantled and equipment sold.
Oxbow Tungsten; P.A.B. Oil Mining Co.	Elko	...do...	2	Mill, gravity, flotation.	181 t/d	A	Last known operating year was 1978. Mill reportedly not intact. Possesses flotation cells and tables. Crushing equipment removed.
Springer; Utah International, Inc.	Pershing ...	...do...	42	Flotation	1,800 t/d	A	Normal crushing rate is about 900 t/d. Final product is ammonium paratungstate.
Tungsten Mountain; Opportunity Village (owner).	Churchill ...	Active ...	52	Mill, table, flotation.	1.8 t/h	A	Mill originally set up for tungsten recovery. Contains 5 tables and 2 flotation cells. In 1984, Pt, with minor Au and Ag, recovery was attempted.
Wells; Nevada Milling Inc.	Elko	Idle	5	Gravity, flotation.	91 t/h	A	Rehabilitated in December 1983; operating in 1984.

A Captive.
B Custom or accepts custom.
NA Not available.

[1] Refer to figure 10.

[2] Approximate feed unless otherwise noted in comments.

NOTE.—An entry of "mill" in method indicates crushing ability.

REVIEW OF SELECTED MINERAL COMMODITIES IN NEVADA

ALUMINUM

Aluminum, the third most abundant element in the Earth's crust, is second only to iron in terms of value of nonfuel mineral products in world commerce. The United States, the world's largest producer of aluminum metal, has accounted for about 30% of the world smelter output over the past 5 yr. At the present time, the only commercially viable smelter feed for the production of aluminum metal is alumina (Al_2O_3) obained from bauxite ores. The United States imports over 90% of the aluminum raw material (both bauxite and alumina) it uses; however, it is technically feasible to produce aluminum from domestic nonbauxite materials such as high-alumina clays, alunite, anorthosite, dawsonite in spent oil shale, and coal waste. Several deposits of nonbauxitic aluminous materials occur in Nevada—several hundred million metric tons of alunitized rock (<30% alunite) has been identified in the southern part of the State and significant deposits of kyanite-related minerals occur in Douglas, Mineral, and Pershing Counties (*239*). Future development of these resources depends on their ability to economically compete with foreign bauxite deposits and other domestic nonbauxitic sources of supply.

Bureau of Mines Mineral Industry Location System (MILS) Data—Aluminum in Nevada

Total properties	68
Producers[1]	0
Known principal deposits	4
Deposit abstracts in directory	1

[1] Producers of materials for aluminum only.

Reported Bauxite Production—United States and Nevada, 1978–83 (*728–729*)

Year	United States[1]		Nevada	
	10^3 t	Value, 10^3	10^3 t	Value, 10^3
1978	1,669	$23,185	NRP	NRP
1979	1,821	24,875	NRP	NRP
1980	1,559	22,353	NRP	NRP
1981	1,510	26,489	NRP	NRP
1982	732	12,334	NRP	NRP
1983	679	11,309	NRP	NRP

NRP No reported production.

[1] From 1978 to 1982, between 74% and 82% of domestically mined bauxite was used in the production of alumina. In 1983, no domestically mined bauxite was used in the production of aluminum metal.

Principal Known Aluminum Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	wt %	Year	Reference
Boyd	Lincoln	Past producer[3]	Alunite	Small	43 289	[4]29.3 [4]21.5	1978	239
C-M Alunite[5]	do	Prospect	do	Medium	(6)	(6)	NAp	NAp
Goldfield district:								
CTR leases	Esmeralda	Explored	do	do	100	[4]22	1978	239
MTZ lease	do	do	do	do	60,000	[4]20	1978	239
Hawthorne	Mineral	Past producer	Andalusite, corundum	do	13,608-27,216	[7]27	1967	277

NAp not applicable.

[1] Based on estimate of metric tons of contained Al_2O_3: Large, >100 million; medium, 1 million to 100 million; small, <1 million.

[2] Rounded.

[3] Lens of alunite mined for fertilizer.

[4] Wt % alunite.

[5] Deposit abstract in directory.

[6] No published data have been located.

[7] Wt % Al_2O_3.

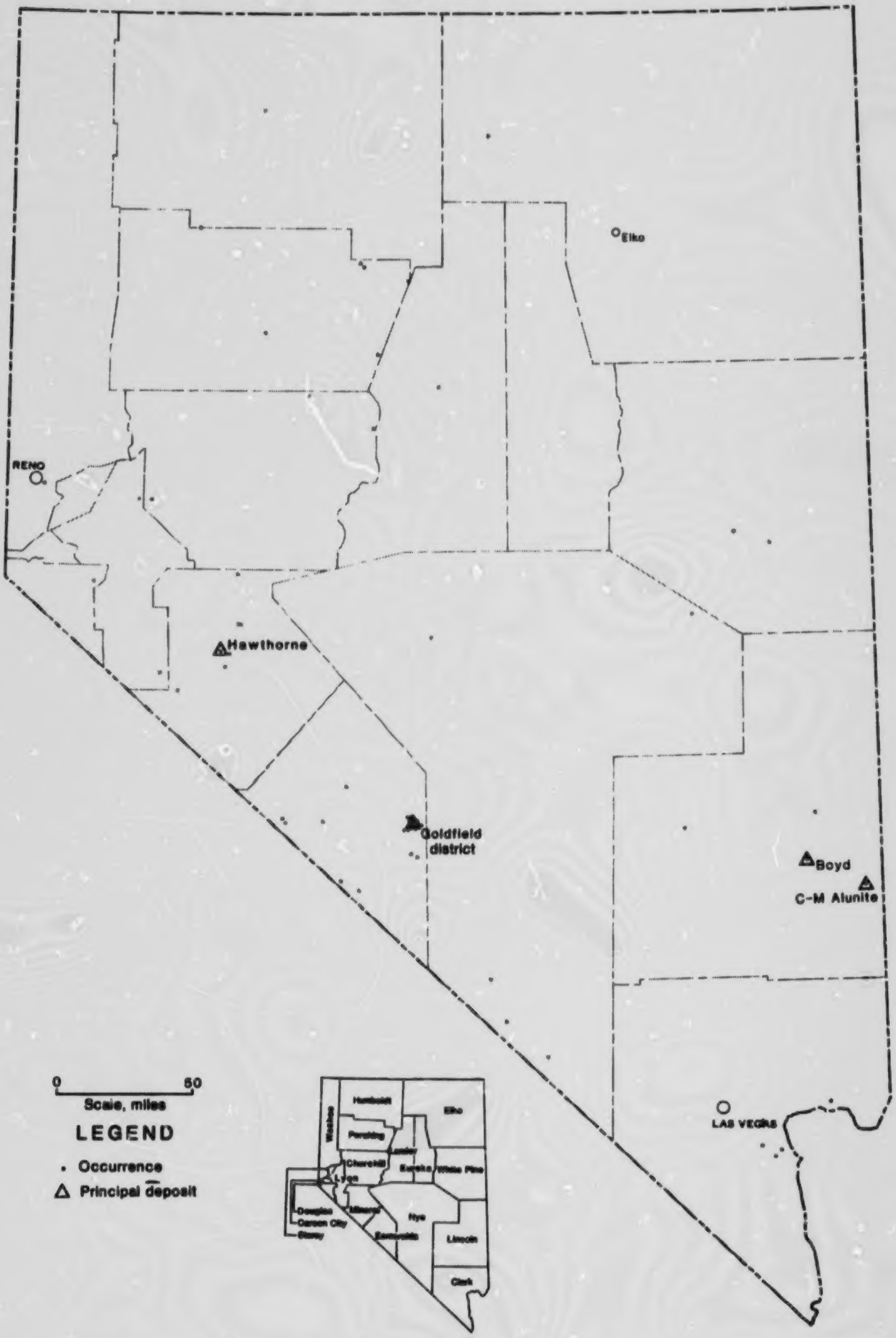
Elko
RENO
Hawthorne
Goldfield district
Boyd
C-M Alunite
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 12.—Aluminum in Nevada.

ANTIMONY

Antimony, a brittle, silver-white metal, is consumed in minor amounts when compared with other base metals. Apparent U.S. annual antimony consumption averaged slightly more than 32,000 t from 1978 through 1983. In 1983, about 50% of consumption need was satisfied by recycling of old scrap, principally plates from lead-acid batteries. The remainder was supplied by domestic mines and imports of antimony metal, compounds, and ores. From 1978 to 1982 reported U.S. mine production averaged about 580 t, or less than 2% of domestic consumption.

Bureau of Mines Mineral Industry Location System (MILS) Data—Antimony in Nevada

Total properties	239
Producers[1]	44
Known principal deposits	13
Deposit abstracts in directory	9

[1] Includes past producers.

Antimony has been sporadically recovered from Nevada mines since the 1860's. The principal periods of production were during World War I and World War II, when increased demand and reduced imports caused antimony prices to increase. The last recorded production of antimony in Nevada was in 1974.

Reported Antimony Production[1]—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	10^3 t	Value, 10^3	10^3 t	Value, 10^3
1978	724	W	NRP	NRP
1979	655	W	NRP	NRP
1980	311	W	NRP	NRP
1981	586	W	NRP	NRP
1982	456	W	NRP	NRP
1983	760	W	NRP	NRP

NRP No reported production.

W Withheld to avoid disclosing company proprietary data.

[1] Antimony content of domestic ores and concentrates.

Principal Known Antimony Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					10^3 t	wt %	Year	Reference
Antimony King[2]	Lander	Past producer	Sb	Small	(3)	(3)	NAp	NAp
Bloody Canyon[2]	Pershing	do	Sb, Ag	do	(3)	(3)	NAp	NAp
Bray-Beulah[2]	Lander	do	Sb, Ag	do	(3)	(3)	NAp	NAp
Drumm	Churchill	do	Sb	Unknown	(3)	(3)	NAp	NAp
Dry Canyon[2]	Lander	do	Sb, Ag	Small	(3)	(3)	NAp	NAp
Fencemaker[2]	Pershing	do	Sb	Medium	(3)	(3)	NAp	NAp
Hard Luck-Pradier[2]	Lander	do	Sb, Ag	Small	(3)	(3)	NAp	NAp
Hollywood[2]	Pershing	do	Sb, Ag	do	(3)	(3)	NAp	NAp
Hoyt	Churchill	do	Sb, Ag	Unknown	(3)	(3)	NAp	NAp
IHX	do	do	Sb	do	(3)	(3)	NAp	NAp
New Potosi	Mineral	do	Au, Ag, Pb, Sb	do	(3)	(3)	NAp	NAp
Sutherland[2]	Pershing	do	Sb	Small	(3)	(3)	NAp	NAp
White Caps[2]	Nye	do	Au, Sb, As, Hg	do	(3)	(3)	NAp	NAp

NAp Not applicable.

[1] Based on estimate of metric tons of contained Sb: Large, >50,000; medium, 5,000 to 50,000; small, <5,000.

[2] Deposit abstract in directory.

[3] No published data have been located.

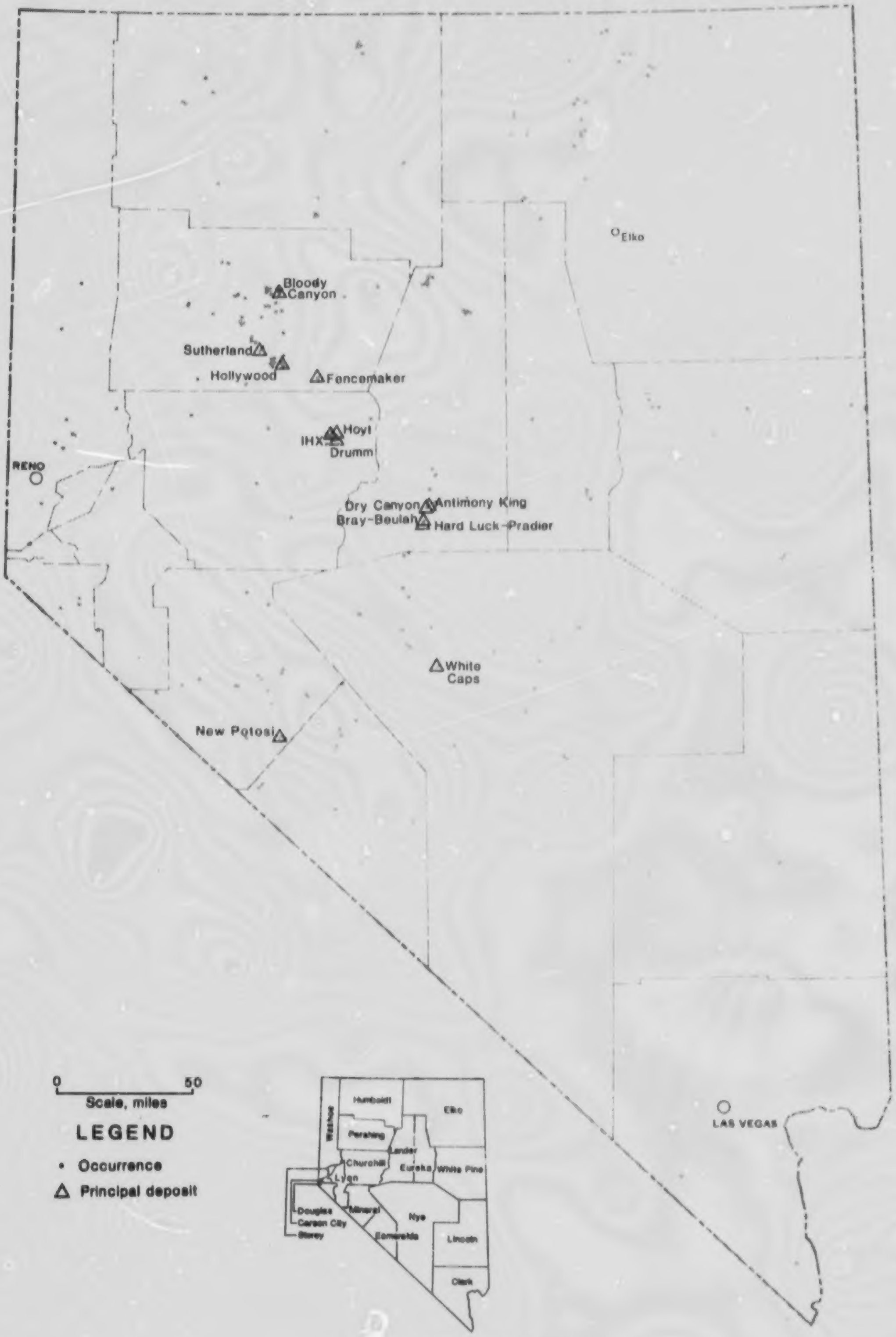
Bloody Canyon
Sutherland
Hollywood
Fencemaker
Hoyt
IHX
Drumm
RENO
Elko
Dry Canyon
Antimony King
Bray-Beulah
Hard Luck-Pradier
White Caps
New Potosi
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 13.—Antimony in Nevada.

BARITE

Barite (barium sulfate) is primarily used as a weighting agent in oil well drilling (over 90% of 1982 production), paint manufacturing, glassmaking, rubber, and as a source of barium chemicals. In 1981, domestic production of barite reached record levels of 2.5 million t; in 1982, production decreased to 1.67 million t; and by 1983, domestic output declined to only 26% of the 1981 level. Of the seven States reporting production in 1982, Nevada accounted for 85% of the total.

Bureau of Mines Mineral Industry Location System (MILS) Data—Barite in Nevada

Total properties	235
Producers[1]	125
Known principal deposits	23
Deposit abstracts in directory	17

[1]Includes past producers.

Reported Barite Production—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	10^3 t	Value, 10^3	10^3 t	Value, 10^3
1978	1,969	$45,130	1,622	$30,034
1979	1,916	53,581	1,637	35,707
1980	2,037	65,957	1,740	47,800
1981	2,585	102,439	2,252	79,716
1982	1,674	69,522	1,429	52,727
1983	684	29,203	601	21,736

Principal Known Barite Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	sp gr	Year	Reference
Ann[3]	Nye	Explored	$BaSO_4$	Medium	(4)	(4)	NAp	NAp
Argenta[3]	Lander	Producer	$BaSO_4$	do	(4)	(4)	NAp	NAp
Bald Mountain	do	Past producer	$BaSO_4$	Unknown	(4)	(4)	NAp	NAp
Big Ledge[3]	Elko	Explored	$BaSO_4$	Medium	(4)	(4)	NAp	NAp
East Northumberland[3]	Nye	Producer	$BaSO_4$	do	(4)	(4)	NAp	NAp
Easy Miner[3]	Elko	Past producer	$BaSO_4$	do	(4)	(4)	NAp	NAp
Fish Creek[3]	do	Explored	$BaSO_4$	Large	(4)	(4)	NAp	NAp
Greystone[3]	Lander	Producer	$BaSO_4$	Medium	(4)	(4)	NAp	NAp
Heavy Spar[3]	Elko	Past producer	$BaSO_4$	do	(4)	(4)	NAp	NAp
Jungle[3]	do	do	$BaSO_4$	do	(4)	(4)	NAp	NAp
Kay[3]	Nye	Explored	$BaSO_4$	do	(4)	(4)	NAp	NAp
Lakes[3]	Elko	Past producer	$BaSO_4$	Large	7,300	(4)	1982	304
Miller	Lander	do	$BaSO_4$	Unknown	(4)	(4)	NAp	NAp
Mountain Springs[3]	do	Producer	$BaSO_4$	Large	(4)	(4)	NAp	NAp
P & S[3]	Nye	do	$BaSO_4$	Medium	(4)	(4)	NAp	NAp
Pleasant View	Lander	Past producer	$BaSO_4$	Unknown	(4)	(4)	NAp	NAp
Q-Bar	Elko	Explored	$BaSO_4$	do	(4)	(4)	NAp	NAp
Queen Lode[3]	do	Past producer	$BaSO_4$	Medium	(4)	(4)	NAp	NAp
Reeds Canyon	Lander	Explored	$BaSO_4$	Unknown	(4)	(4)	NAp	NAp
Rossi[3]	Elko	Past producer	$BaSO_4$	Large	(4)	(4)	NAp	NAp
Slaven Canyon	Lander	Producer	$BaSO_4$	Unknown	(4)	(4)	NAp	NAp
Snoose[3]	Elko	Past producer	$BaSO_4$	Medium	(4)	(4)	NAp	NAp
Stormy Creek[3]	do	do	$BaSO_4$	do	(4)	(4)	NAp	NAp

NAp Not applicable.

[1]Based on estimate of metric tons of contained barite: Large, >5 million; medium 50,000 to 5 million; small, <50,000.

[2]Rounded.

[3]Deposit abstract in directory.

[4]No published data have been located.

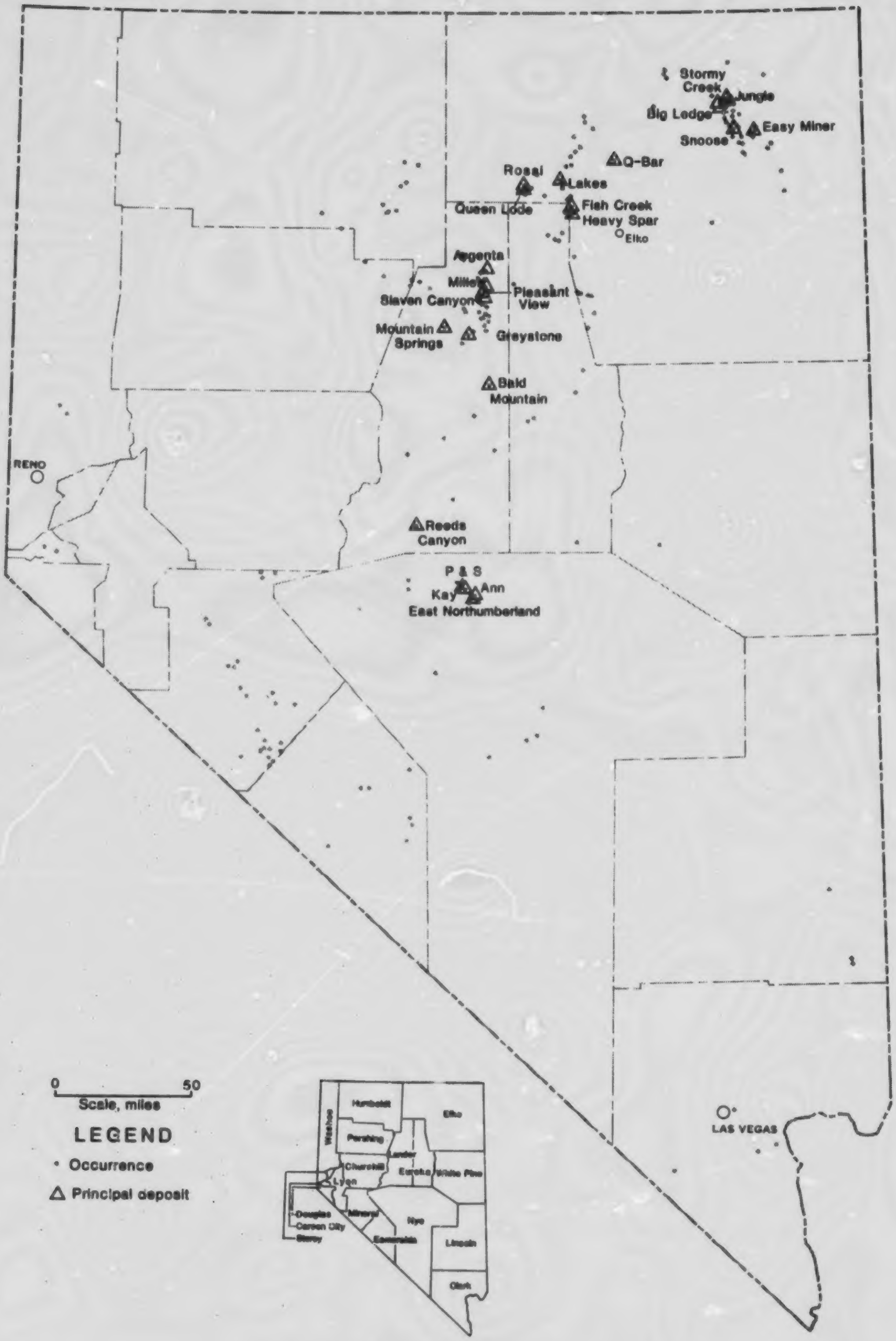
Stormy Creek
Jungle
Big Ledge
Easy Miner
Snoose
Q-Bar
Rossi
Lakes
Queen Lode
Fish Creek
Heavy Spar
Elko
Argenta
Miller
Slaven Canyon
Pleasant View
Mountain Springs
Greystone
Bald Mountain
RENO
Reeds Canyon
P & S
Kay
Ann
East Northumberland
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 14.—Barite in Nevada.

BERYLLIUM

Beryllium, a lightweight, hard metal with a high strength-to-weight ratio, has high electrical, thermal shock, and corrosion resistance as well as high thermal conductivity. Although high costs have limited the amount of beryllium consumed (annual domestic consumption from 1978 through 1982 averaged 234 t), it is used where its unique combination of physical characteristics are required. Its uses are varied and range from components in electronic switchgear, to brake shoes, to heat shields in aerospace equipment, to neutron moderators or reflectors in nuclear reactors. About 80% of the U.S. consumption of beryllium is in the form of copper alloys; the remainder is evenly divided between beryllium oxide and beryllium metal. Prior to the development of the Spor Mountain bertrandite deposits in Utah in the late 1960's, the United States was almost wholly dependent on imported beryl to meet domestic demand. Since that time the United States has become a major producer capable of supplying much of its beryllium requirements. Nevada has several beryllium occurrences; however, only small amounts have been mined in the past.

Bureau of Mines Mineral Industry Location System (MILS) Data—Beryllium in Nevada

Total properties	22
Producers[1]	5
Known principal deposits	1
Deposit abstracts in directory	1

[1] Includes past producers.

Reported Beryllium Production—United States and Nevada, 1978–83 (*728–729*)

Domestic production of beryllium is withheld from publication to avoid disclosing company proprietary data. No beryllium production was reported in Nevada from 1978 through 1983.

Principal Known Beryllium Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					10^3 t	wt %	Year	Reference
Mount Wheeler[2]	White Pine	Developed	Be, CaF_2, W	Large	(3)	(3)	NAp	NAp

NAp Not applicable.

[1] Based on estimate of metric tons of contained BeO: Large, >1,000; medium, 10 to 1,000; small, <10.

[2] Deposit abstract in directory.

[3] No published data have been located.

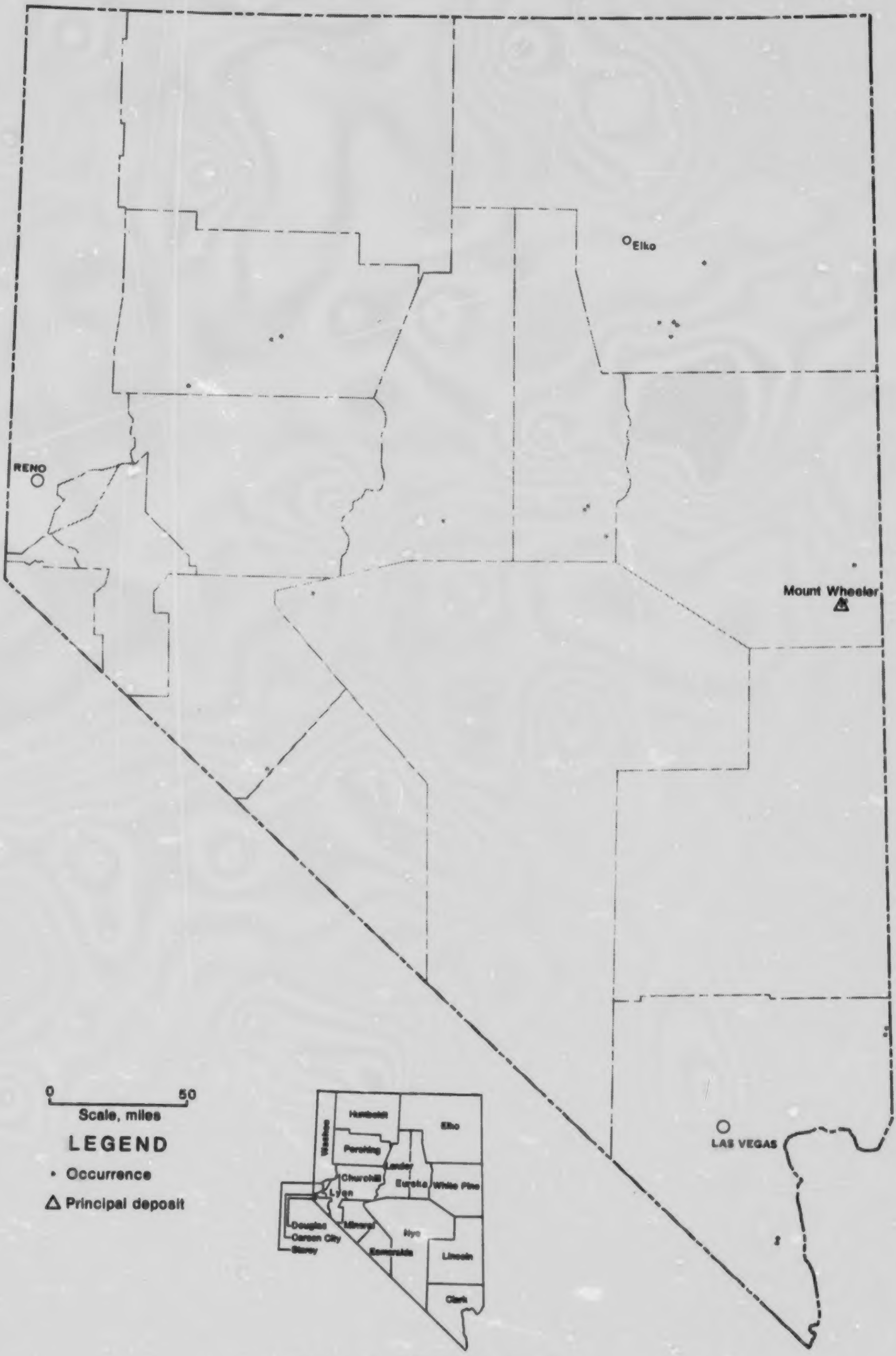
Elko
RENO
Mount Wheeler
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Lyon
Eureka
White Pine
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 15.—Beryllium in Nevada.

COPPER

Copper, primarily used by ancient civilizations for jewelry, coinage, and weaponry, is used by modern society in thousands of applications because it possesses a versatility surpassed by few metals. More than 50% of the copper produced domestically is used in the electrical and communications industries, while another 40% is used in brass mills.

A lengthy labor strike in 1980 effectively immobilized 10 major domestic producers, which resulted in a substantial production decrease when compared with 1979 levels. In 1981, 15 mines in Nevada were producing copper ore, the bulk of which was from Duval's Copper Basin Mine; only 3 mines reported copper production in 1982. Although the United States continues to be a major copper producing nation, in 1982, for the first year since 1934 and for only the second year since 1883, the United States did not lead the world in newly mined copper. In 1982, the United States ranked second behind Chile and ahead of the U.S.S.R., Canada, Zambia, and 58 other countries.

A copper deposit was announced by Plexus Resources Corp., Salt Lake City, UT, in its 1984 annual report. The deposit, called the Lyon, is part of the Pumpkin Hollow iron-copper skarn complex in east-central Lyon County. The deep-seated Lyon deposit is reported to contain high-grade geologic reserves of 7.5 million tons of 3.1% Cu, 8.6 g/t Ag, and 0.51 g/t Au. Additionally, there is 26 million tons of 1.1% Cu peripheral to the high-grade zone. Unfortunately, the announcement of this significant copper deposit came too late for inclusion in this section's copper table and location map (fig. 16).

Bureau of Mines Mineral Industry Location System (MILS) Data—Copper in Nevada

Total properties	1,116
Producers[1]	637
Known principal deposits	8
Deposit abstracts in directory	8

[1] Includes past producers.

Reported Copper Production[1]—United States and Nevada, 1978–83 (*728–729*)

Year	United States[1]		Nevada	
	[2]10^3 t	Value, 10^3	[2]10^3 t	Value, 10^3
1978	1,358	$1,990	20	$30
1979	1,444	2,961	W	W
1980	1,181	2,667	W	W
1981	1,538	2,886	W	W
1982	1,140	1,840	W	W
1983	1,038	1,750	W	W

W Withheld to avoid disclosing company proprietary data.

[1] Contained copper.

[2] Rounded.

Principal Known Copper Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	wt %	Year	Reference
Ann Mason[3]	Lyon	Explored	Cu, Mo	Large	449,056	0.4	1976	829
Battle Mountain Copper Basin.[3]	Lander	Standby	Cu, Ag, Au	Medium	860	1.49	1978	707
						[4].925	1978	707
						[5]13.32	1978	707
Bear[3]	Lyon	Explored	Cu, Mo, Au, Ag	Large	453,592	.4	1979	829
McArthur[3]	do	do	Cu	do	11,793	.43	1976	822
McGill Tailings[3]	White Pine	Explored	Cu, Ag, Au	Medium	36,287- 72,575	.3- .4	1979	413
Robinson district[3]	do	Past producer	Cu, Mo, Au, Ag	Large	82,554	.67	1976	792
Victoria[3]	Elko	Standby	Cu, Ag, Bi	Medium	1,353	[6]2.34	1977	337
					135	[7]2.51	1977	337
Yerington[3]	Lyon	Past producer	Cu, Mo, Ag, Au	Large	115,122	.34	1982	49

[1] Based on estimate of metric tons of contained Cu: Large, >1 million; medium, 50,000 to 1 million; small, <50,000.

[2] Rounded.

[3] Deposit abstract in directory.

[4] g/t Ag.

[5] g/t Au.

[6] Proven.

[7] Probable.

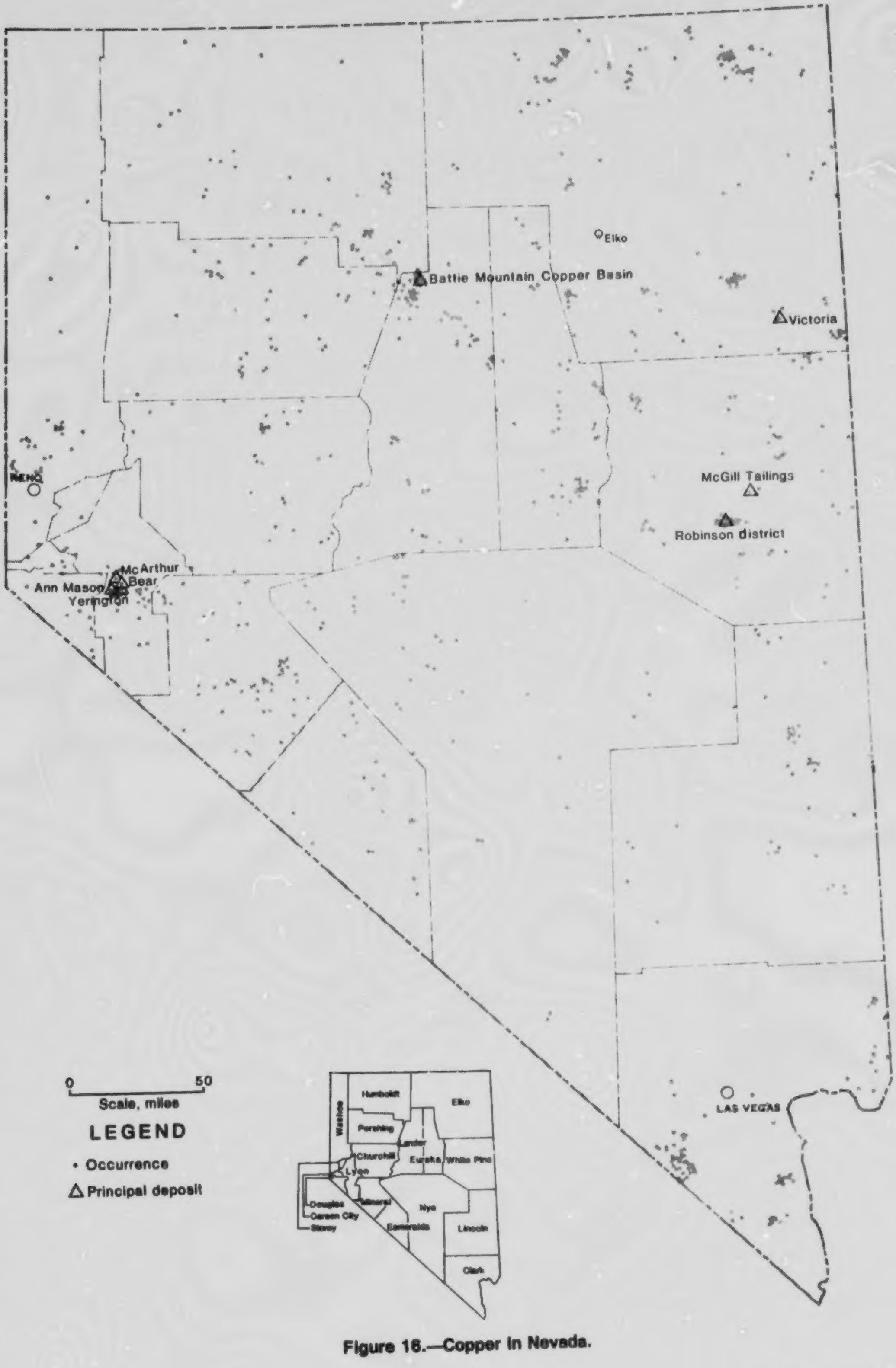
Battle Mountain Copper Basin
Elko
Victoria
RENO
McGill Tailings
Robinson district
McArthur
Bear
Ann Mason
Yerington
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 16.—Copper in Nevada.

FLUORSPAR

Fluorspar is a nonmetallic aggregate containing a sufficient quantity of fluorite (CaF_2) to be of commercial value. Two producers in southern Illinois accounted for over 90% of the domestic fluorspar production in 1983; the remainder was from Nevada and Texas. The manufacture of hydrofluoric acid, used in the aluminum, fluorchemical, and uranium industries, accounted for approximately 64% of the fluorspar consumed domestically in 1983. Another 34% was used as a flux in steelmaking. Enamels, glass manufacture, coatings for welding rods, and other end uses accounted for the remainder of 1983 consumption. In 1981, 1982, and 1983, the Crowell Mine (Daisy) in Nye County was the sole producer of fluorspar in Nevada. The metallurgical grade fluorspar produced at the Crowell Mine was shipped to steel plants in California.

Bureau of Mines Mineral Industry Location System (MILS) Data—Fluorspar in Nevada

Total properties	152
Producers[1]	47
Known principal deposits	9
Deposit abstracts in directory	6

[1] Includes past producers.

Reported Fluorspar Production[1]—United States and Nevada, 1978–83 (*728–729*)

Year	United States[1]		Nevada	
	[2]10^3 t	Value, 10^3	[2]10^3 t	Value, 10^3
1978	117,415	$13,261	W	W
1979	99,154	12,162	W	W
1980	84,037	12,611	W	W
1981	104,693	18,412	W	W
1982	69,869	13,293	W	W
1983	55,000	10,000	W	W

W Withheld to avoid disclosing company proprietary data.

[1] As measured by finished shipments.

[2] Rounded.

Principal Known Fluorspar Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[illegible]	wt %	Year	Reference
Bisoni[2]	Eureka	Explored prospect	CaF_2, Zn, Be	Large	(3)	(3)	NAp	NAp
Chicago Lode	Nye	Past producer	CaF_2	Unknown	(3)	(3)	NAp	NAp
Crowell[2]	do	Producer	CaF_2	Medium	(3)	(3)	NAp	NAp
Horseshoe	do	Past producer	CaF_2	Unknown	(3)	(3)	NAp	NAp
Mammoth[2]	do	Explored	CaF_2	Medium	(3)	(3)	NAp	NAp
Nyco[2]	do	Past producer	CaF_2	do	(3)	(3)	NAp	NAp
Rainbow[2]	do	do	CaF_2	Small	(3)	(3)	NAp	NAp
Union Canyon	do	do	CaF_2	Unknown	(3)	(3)	NAp	NAp
White Pine[2]	do	Explored prospect	CaF_2	Large	(3)	(3)	NAp	NAp

NAp Not applicable.

[1] Based on estimate of metric tons of contained CaF_2: Large, >5 million; medium, 50,000 to 5 million; small, <50,000.

[2] Deposit abstract in directory.

[3] No published data have been located.

GOLD

Gold production in Nevada increased from 26% of total U.S. production in 1978 to 47% of U.S. total in 1983. Since 1980, Nevada has been the largest gold producing State. Nevada gold production more than tripled between 1978 and 1983. Nevada 1982 gold production was 28,626 kg. Production by the end of 1984 could easily be at the annual rate of 29,000 kg. After mid-decade, Nevada could be annually producing 31,000 kg (1 million oz) gold as new properties come on stream and several existing producers complete expansion. As a comparison, total 1983 U.S. gold production was 60,900 kg.

Most Nevada gold discoveries are very recent. Announcement of new Nevada discoveries and plans for mine-mill development have been commonplace up to the present time.

One of the most recent discoveries was announced by AMAX Inc. in February 1985. Named the Sleeper, this gold and silver ore body is located about 50 km northwest of Winnemucca in Humboldt County. AMAX intends to develop and produce initially from a high-grade portion of the 3.8 million t ore body that, on the whole, averages 4.5 g/t Au and 25 g/t Ag. Production is scheduled to commence by mid-1986 at the mine rate of 450 t/d, producing about 1,700 kg Au and 1,900 kg Ag annually. Unfortunately, the announcement of this significant Nevada discovery came too late to include in the tabulation of principal known gold deposits below and on figure 18.

Bureau of Mines Mineral Industry Location System (MILS) Data—Gold in Nevada

Total properties	2,476
Producers[1]	1,726
Known principal deposits	52
Deposit abstracts in directory	33

[1] Includes past producers.

Reported Gold Production[1]—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	10^6 kg	Value, 10^3	kg	Value, 10^3
1978	31.1	$193,324	8,125	$50,496
1979	30.0	296,550	7,779	76,905
1980	30.2	594,050	8,662	170,595
1981	42.9	633,918	16,323	241,220
1982	45.6	550,966	23,548	284,601
1983	60.9	829,929	28,626	390,226

[1] Data are rounded.

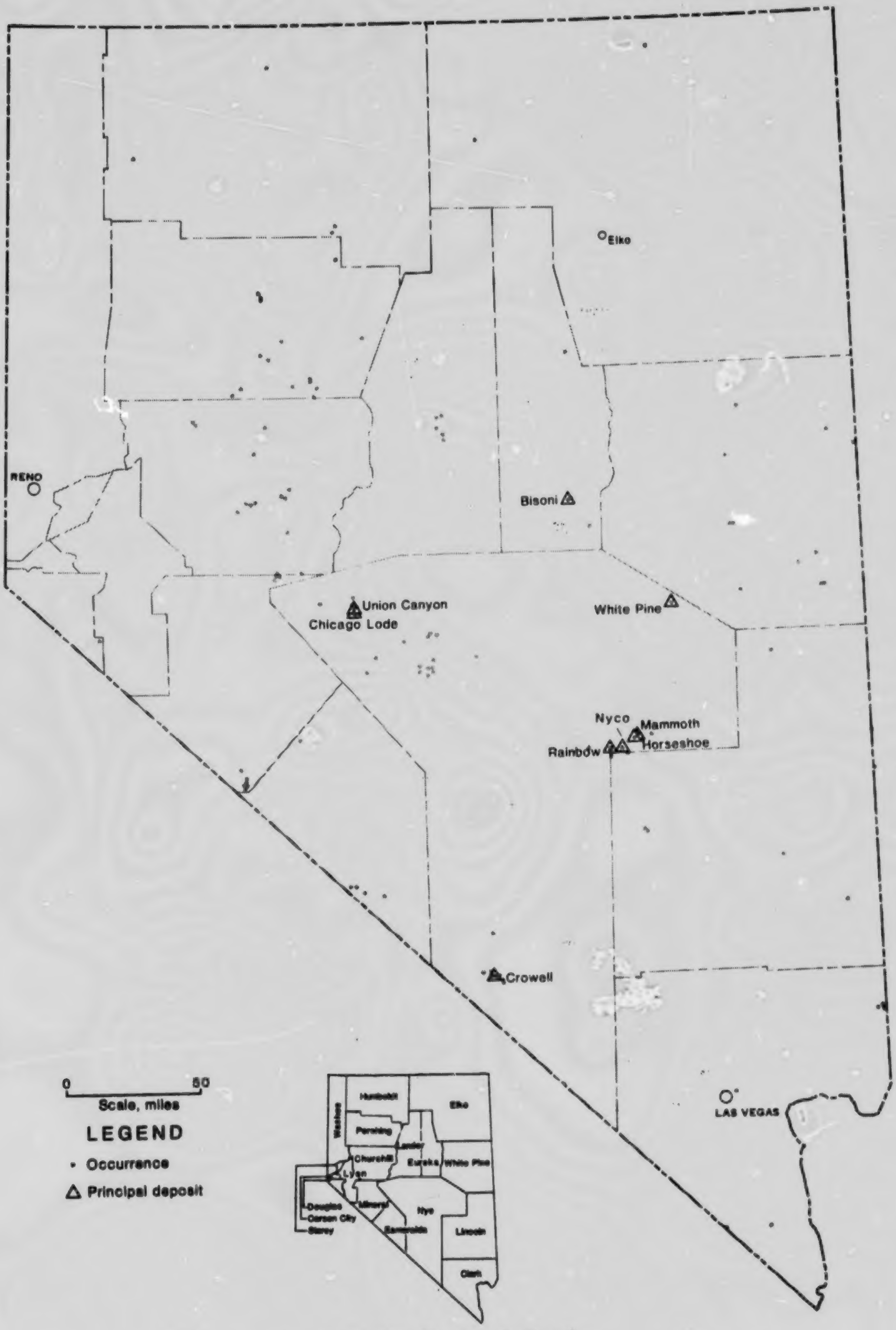
Elko
RENO
Bisoni
Union Canyon
Chicago Lode
White Pine
Nyco
Mammoth
Horseshoe
Rainbow
Crowell
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Mineral
Nye
Douglas
Carson City
Storey
Esmeralda
Lincoln
Clark

Figure 17.—Fluorspar in Nevada.

Principal Known Gold Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^6 t	g/t Au	Year	Reference
Alligator Ridge[3]	White Pine	Active-producer	Au, Ag, Hg	Medium	3.5	3.1	1983	15
Atlanta[3]	Lincoln	do	Au, Ag	Small	.9	3.0 [4]55.0	1980	61
Aurora[3]	Mineral	Active-producer, testing and developing.	Au, Ag	do	1.4	4.42 [4]10.0	1982	309, 444
Bald Mountain[3]	White Pine	Active-testing and developing.	Au	do	2.5	3.1	1984	499
Battle Mountain Copper Canyon:[3] Fortitude.	Lander	Active-producer	Au, Ag	Medium	14.5	4.8 [4]18.0	1983	435
Bell Mountain[3]	Churchill	Active-developing, exploration.	Au, Ag	Small	2.5	2.02 [4]56	1984	208
Blue Star[3]	Eureka	Active-intermittent producer.	Au	do	1.6	4.1 [4]100	1974	517
Bootstrap[3]	Elko	Active-producer[5]	Au, Ag	do	<.9	1.5	1979	378
Borealis[3]	Mineral	do	Au, Ag, Hg	do	2.3 2.7	2.7 [4]2.1	1981	383
Buckhorn[3]	Eureka	do	Au, Ag	do	4.5	1.5 [4]20	1983	769
Buckskin	Douglas	Active-developing	Au, Cu, Ag	do	.36	(6)	1983	394
Bullion Monarch[3]	Eureka	Active-producer	Au, Ag	Small	(7)	(7)	NAp	NAp
Carlin[3]	do	do	Au, Ag, Hg	Medium	[8]4.08	[8]5.5	1983	511
Cortez	do	Active-past producer[9]	Au	Small	(7)	(7)	NAp	NAp
Dee[3]	Elko	Active-producer	Au	do	[10]2.420 [11]1.010	[10]3.94 [11].96	1983	493
Dexter:								
High-grade zone	do	Active-exploration	Au, Ag	do	1.8	1.37 [4]65.1	1984	524, 534
Low-grade zone	do	do	Au, Ag	do	1.7	34 [4]2.4	1984	524, 534
Dry Canyon (Quito)	Lander	Active-exploration	Au, Sb	Small	1.36	6.9	1984	799
Eldorado Canyon	Clark	do	Au	Unknown	(7)	(7)	NAp	NAp
Enfield Bell (Jerritt Canyon).[3]	Elko	Active-producer	Au	Medium	12.4	7.03	1984	313
Fire Creek	Lander	Active-producer	Au	Small	.32	2	1982	611
Florida Canyon	Pershing	Inactive-explored	Au	do	18	.7	1984	662
Gance Creek	Elko	Active-exploration	Au	Unknown	(7)	(7)	NAp	NAp
Getchell[3]	Humboldt	Active-past producer, exploration.	Au, Ag, W	Small	2.950 9	6.2 5.5	1982	61
Gold Bar	Eureka	Active-exploration	Au	do	2.5	3	1984	660
Gold Hill	Storey	Inactive	Au, Ag	do	(7)	(7)	NAp	NAp
Gold Quarry[3]	Eureka	Active-developing	Au, Hg	Large	[12]166 [13]122	[12]1.47 [13]1.65	1983	511
Goldfield[3]	Esmeralda	do	Au, Ag	Small	1.919	2.4	1984	502
Goldstrike[3]	Eureka	Active-producer	Au, Ag	do	(7)	(7)	NAp	NAp
Hilltop	Lander	Active-feasibility	Au	do	[14]9.34	[14]2.5	1984	532
Hog Ranch	Washoe	Active-exploration	Au	do	(15)	(15)	1984	611
Horse Canyon[3]	Eureka	Active-producer	Au	do	3.121	1.89	1982	564
Ivanhoe	Elko	Inactive-explored	Au	do	(16)	(16)	1984	611
Lewis	Humboldt	Active-developing	Au, Ag	do	>9.1	NA	1984	501
Lucerne	Lyon	Inactive-explored	Au	do	(7)	(7)	NAp	NAp
Maggie Creek[3]	Eureka	Active-producer	Au	do	3.3	2.7	1984	511
Manhattan[3]	Nye	do	Au, Ag	do	4.5	1.2	1983	311
Mesona	Elko	Active-exploration	Au	do	(7)	(7)	NAp	NAp
Northumberland[3]	Nye	Active-producer	Au, Ag	do	15.4	1.5	1981	61
Paradise Peak	do	Active-developing	Au, Ag	Medium	9.1	3.4 [4]103	1984	611, 772
Pinson[3]	Humboldt	Active-producer	Au, Ag, Hg	Small	[10]2.7 [11]2.2	[10]3.19 [11].89	1983	667
Preble[3]	do	do	Au	do	1.6	2.13	1984	770
Rain[3]	Elko	Active-exploration	Au, Ag	do	[17]7.5	2.85	1983	511
Rawhide	Mineral	do	Au, Ag	do	(18)	(18)	1984	611
Relief Canyon[3]	Pershing	Active-producer	Au, Ag	do	8	1.1	1984	658
Round Mountain[3]	Nye	do	Au, Ag	Large	177.3	1.5 [4].79	1981	388
Santa Fe[3]	Mineral	Active-feasibility	Au, Ag	Small	[19]10.4	1.88 [4]20.9	1983	531, 657
Sterling[3]	Nye	Active-producer	Au, Ag, Hg	do	.18	6.9	1983	533
Tonkin Springs:[3]								
Upper zone	Eureka	Active-exploration	Au	do	2.3	3	1983	241
Lower zone	do	do	Au	do	.45	3	1983	241
Tonopah Divide[3]	Esmeralda	Active-producer	Au, Ag	do	(7)	(7)	NAp	NAp
Tonopah Hasbrouck[3]	do	Active-exploration	Au, Ag	do	4.5	2 [4]51	1982	611
Victorine-Kingston	Lander	Active-producer, exploration.	Au, Ag	do	(7)	(7)	NAp	NAp
Windfall[3]	Eureka	Active-producer	Au, Ag	do	2.7	1	1975	805

NAp Not applicable. NA Not available.

[1] Based on estimate of metric tons of contained Au: Large, >90; medium, 90 to 30; small <30.

[2] Rounded.

[3] Deposit abstract in directory.

[4] Silver.

[5] Pit inactive, reserves depleted. Low-grade dump is being leached.

[6] Development ore assayed 6.9 g/t Au, 0.9% Cu, and 14 g/t Ag.

[7] No published data have been located.

[8] Quantity and grade include Carlin and Blue Star reserves.

[9] Low-grade and high-stripping-ratio resource believed remaining; dump material currently being mined.

[10] Mill grade.

[11] Leach grade.

[12] Total resource.

[13] Recoverable reserve.

[14] Contains 5.2 million t averaging 2.7 g/t amenable to open-pit mining.

[15] Contains >3,000 kg Au.

[16] Contains >15,000 kg Au.

[17] Contains 3.1 million t averaging 5.04 g/t Au.

[18] Contains >18,000 kg Au.

[19] Contains 6.3 million t oxide ore averaging 1.6 g/t Au and 15 g/t Ag, and 4.1 million t sulfide ore averaging 2.26 g/t Au and 30.9 g/t Ag.

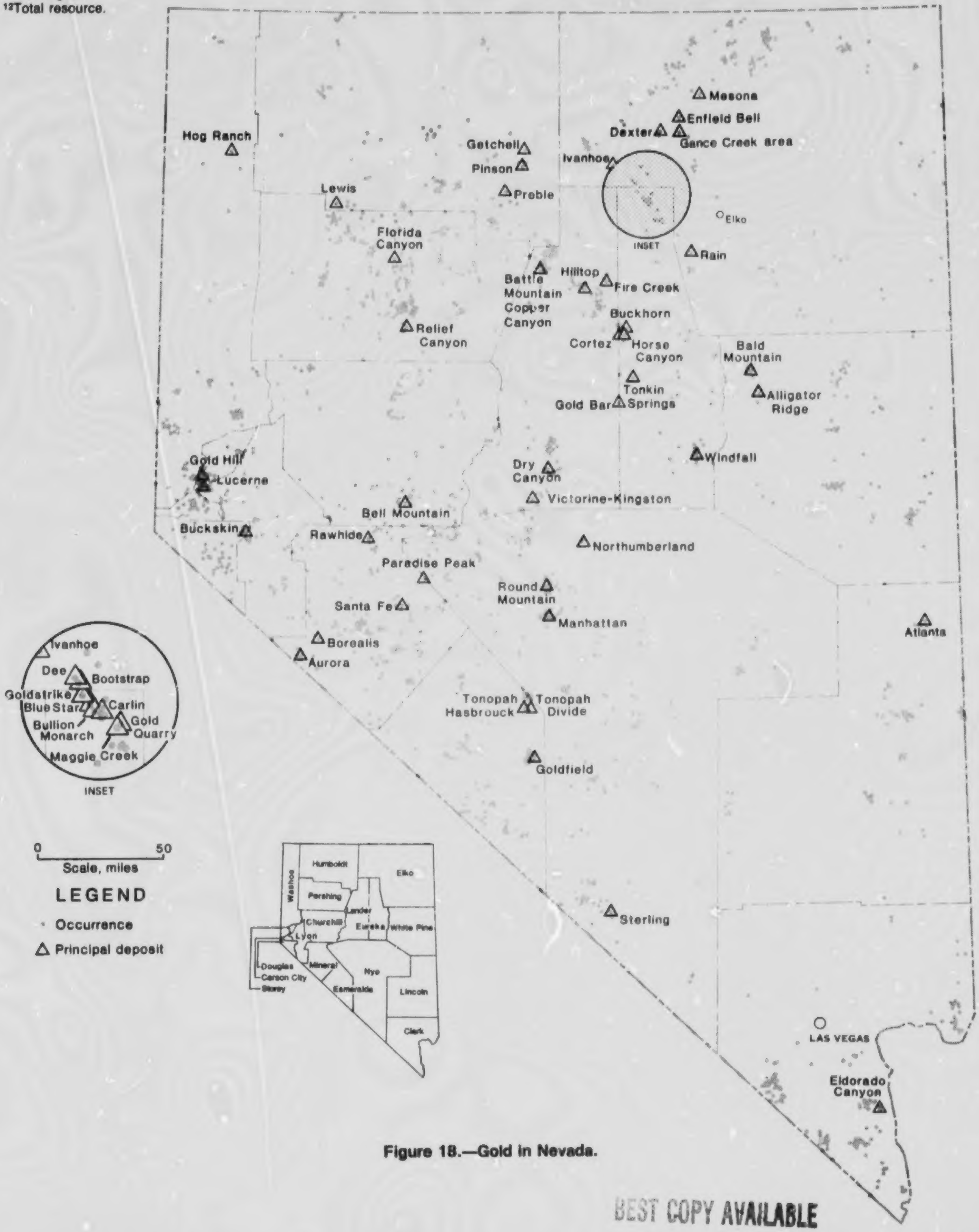
Hog Ranch
Lewis
Florida Canyon
Relief Canyon
Getchell
Pinson
Preble
Ivanhoe
Dexter
Mesona
Enfield Bell
Gance Creek area
Elko
INSET
Rain
Hilltop
Fire Creek
Battle Mountain Copper Canyon
Buckhorn
Cortez
Horse Canyon
Bald Mountain
Tonkin Springs
Gold Bar
Alligator Ridge
Windfall
Dry Canyon
Victorine-Kingston
Gold Hill
Lucerne
Buckskin
Bell Mountain
Rawhide
Paradise Peak
Northumberland
Round Mountain
Manhattan
Santa Fe
Borealis
Aurora
Atlanta
Tonopah Hasbrouck
Tonopah Divide
Goldfield
Sterling
LAS VEGAS
Eldorado Canyon
Ivanhoe
Dee
Bootstrap
Goldstrike
Blue Star
Carlin
Bullion Monarch
Gold Quarry
Maggie Creek
INSET
0
50
Scale, miles
LEGEND
· Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 18.—Gold in Nevada.

IRON ORE

U.S. iron ore production, down about 50% in 1982 when compared with 1981 levels, was at the lowest since 1938. The reduction was largely due to the decline in iron and steel production. In California, a major mine was permanently closed and 9 of 13 taconite operations in the Lake Superior District were closed 7 to 12 months. In Nevada, the Nevada-Barth Corp. continued to ship ore to the Geneva, UT, facility from its mine stockpile near Carlin; production reportedly ended in 1980 because of exhaustion of ore reserves. Two other mines, the Iron Mine in Churchill County and the Cooney Brothers, Pershing County, also reported shipments in 1982.

Bureau of Mines Mineral Industry Location System (MILS) Data—Iron Ore in Nevada

Total properties	216
Producers[1]	77
Known principal deposits	9
Deposit abstracts in directory	9

[1]Includes past producers.

Reported Iron Ore Production[1]—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	[2]10^3 t	Value, 10^3	[2]10^3 t	Value, 10^3
1978	84,542	$2,401,367	W	W
1979	87,602	2,814,440	W	W
1980	70,711	2,544,121	W	W
1981	73,340	2,915,239	100.6	$1,490
1982	36,330	1,491,809	78.9	1,119
1983	45,006	1,944,988	W	W

W Withheld to avoid disclosing company proprietary data.

[1]As measured by shipments; includes byproduct ore.

[2]Rounded.

Principal Known Iron Ore Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	wt %	Year	Reference
Buena Vista[3]	Churchill	Past producer	Fe	Medium	46,000	28.5	1971	[4]454
Calico Hills[3]	Mineral	Unknown	Fe, Cu	Small	([5])	([5])	NAp	NAp
Dayton[3]	Lyon	Explored prospect.	Fe	Medium	46,000	42	1971	454
Dodge-Ford[3]	Pershing	Past producer	Fe	...do	([5])	([5])	NAp	NAp
Minnesota[3]	Douglas	do	Fe	Small	([5])	([5])	NAp	NAp
Modarelli[3]	Eureka	do	Fe	Medium	45,000	42.7	1971	454
Phelps-Stokes[3]	Nye	do	Fe	Small	([5])	([5])	NAp	NAp
Piute[3]	Pershing	Explored prospect	Fe	Large	([5])	([5])	NAp	NAp
Pumpkin Hollow[3]	Lyon	do	Fe, Cu, Au, Ag.	...do	250,000	40 [6].3	1969	771

NAp Not applicable.

[1]Based on estimate of metric tons of contained Fe: Large, >100 million; medium, 5 million to 100 million; small, <5 million.

[2]Rounded.

[3]Deposit abstract in directory.

[4]Buena Vista published reserves-resources are for 3 separate ore bodies and include measured, indicated, and inferred estimates.

[5]No published data have been located.

[6]Wt % Cu.

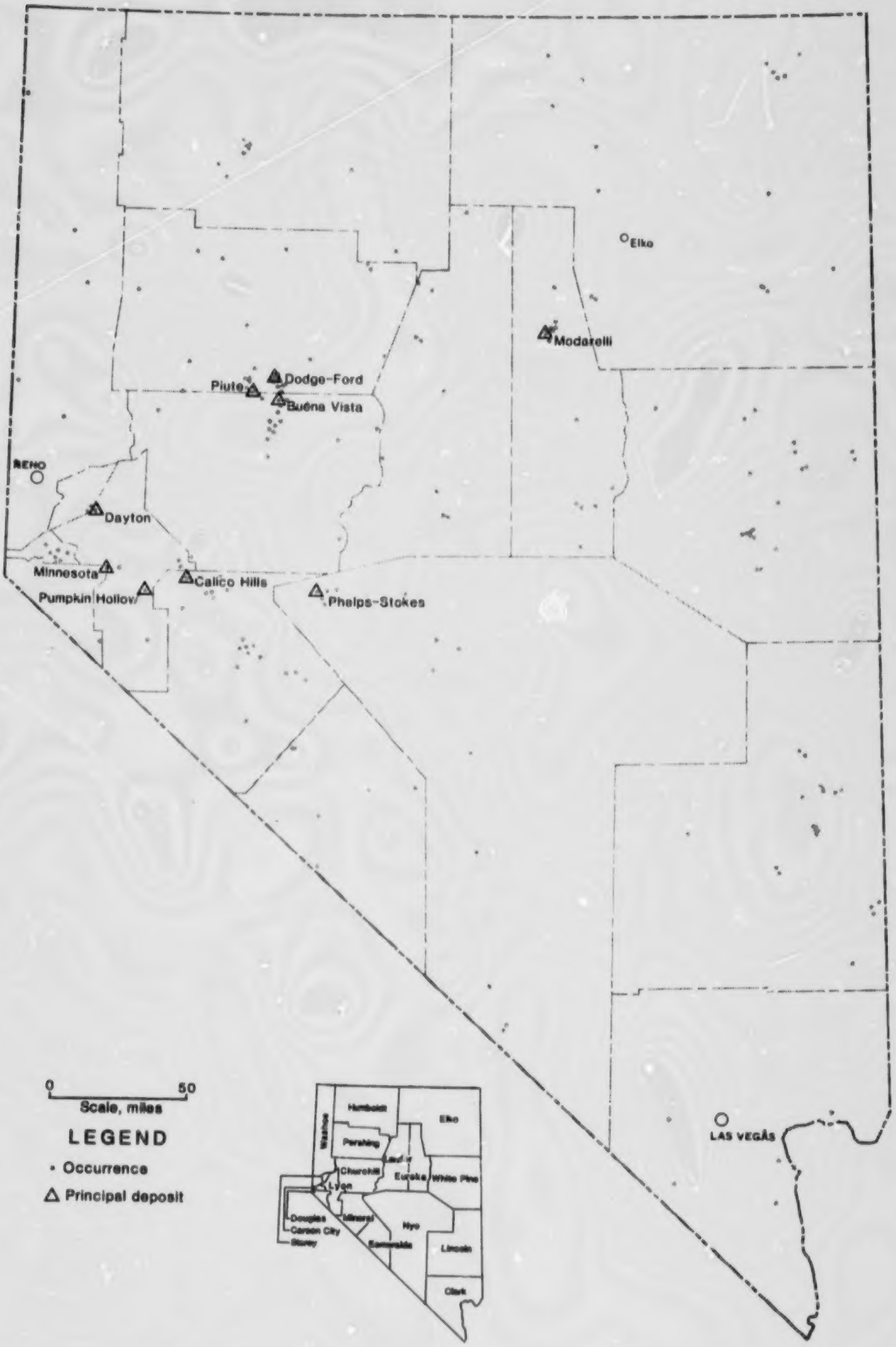
Elko
Modarelli
Dodge-Ford
Piute
Buena Vista
RENO
Dayton
Minnesota
Pumpkin Hollow
Calico Hills
Phelps-Stokes
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 19.—Iron in Nevada.

LEAD AND ZINC

Lead and zinc are two of the most widely used metals in world industry. In terms of tonnage used, lead and zinc rank fifth and fourth, respectively, after iron, aluminum, and copper. In 1982, world mine production of lead and zinc was estimated at 3.5 million and 6.2 million t, respectively, while output from U.S. mines was estimated at 513,000 t lead and 303,000 t zinc.

Although Nevada is not a major producer of either lead or zinc, both metals have been periodically recovered from Nevada mines. The last significant period of production was during the mid-1970's when the Pan American Mine in Lincoln County was operated by the Bunker Hill Co. Since 1979, however, output of lead and zinc has been small.

Bureau of Mines Mineral Industry Location System (MILS) Data—Lead and Zinc in Nevada

Total properties	1,506
Producers[1]	1,051
Known principal deposits	10
Deposit abstracts in directory	6

[1] Includes past producers.

Reported Lead and Zinc Production—United States and Nevada, 1978–83 (*722–723*)

Year	Lead		Zinc	
	10^3 t	Value, 10^3	10^3 t	Value, 10^3
		UNITED STATES		
1978	[1]530	$393,516	[1]303	$206,854
1979	[1]526	609,929	[1]267	219,841
1980	[1]550	515,189	[1]317	261,671
1981	[1]446	358,821	[1]312	306,879
1982	[1]513	288,579	[1]303	257,116
1983	[1]449	214,623	[1]275	251,204
		NEVADA		
1978	0.653	$485	1.371	$937
1979	.024	28	W	W
1980	.026	24	.002	2
1981	W	W	W	W
1982	W	W	0	0
1983	.014	7	0	0

W Withheld to avoid disclosing company proprietary data.
[1] Rounded.

Principal Known Lead and/or Zinc Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	wt %	Year	Reference
Argentena	Clark	Past producer	Zn, Pb, Ag, Au, Cu, V	Small	(4)	(4)	NAp	NAp
Caselton[3]	Lincoln	do	Zn, Pb, Ag, Mn	Medium	(4)	(4)	NAp	NAp
Mountain View	Eureka	do	Zn, Pb, Ag, Cu, Au	Small	(4)	(4)	NAp	NAp
Pan American[3]	Lincoln	do	Zn, Pb, Ag, Mn	Medium	1,992	[5]1.17 [6]2.45 [7]2.07 (sic)	1982	168
Potosi	Clark	do	Zn, Ag, Pb	Small	(4)	(4)	NAp	NAp
Prince[3]	Lincoln	do	Zn, Pb, Ag, Mn	Medium	(4)	(4)	NAp	NAp
Ridge 7129[3]	Eureka	Explored	Zn, V, Mo, Se, oil shale	do	(4)	(4)	NAp	NAp
Ruby Hill[3]	do	Developed	Zn, Au, Ag, Pb	do	2,841	[5]3.7 [6]8.3 [9]5.46 [7]194	1982	168
Ward[3]	White Pine	Active-developing	Zn, Pb, Ag, Cu	do	4,500	[9]5.5 [7]103 [10]1.4	1983	637
Yellow Pine	Clark	Past producer	Zn, Pb, Ag, Cu, Au	do	(4)	(4)	NAp	NAp

NAp Not applicable.
[1] Based on estimate of metric tons of contained Pb and Zn: Large, >1 million; medium, 50,000 to 1 million; small, <50,000.
[2] Rounded.
[3] Deposit abstract in directory.
[4] No published data have been located.
[5] Wt % Pb.
[6] Wt % Zn.
[7] g/t Ag.
[8] g/t Au.
[9] Combined wt % Zn-Pb.
[10] Wt % Cu.

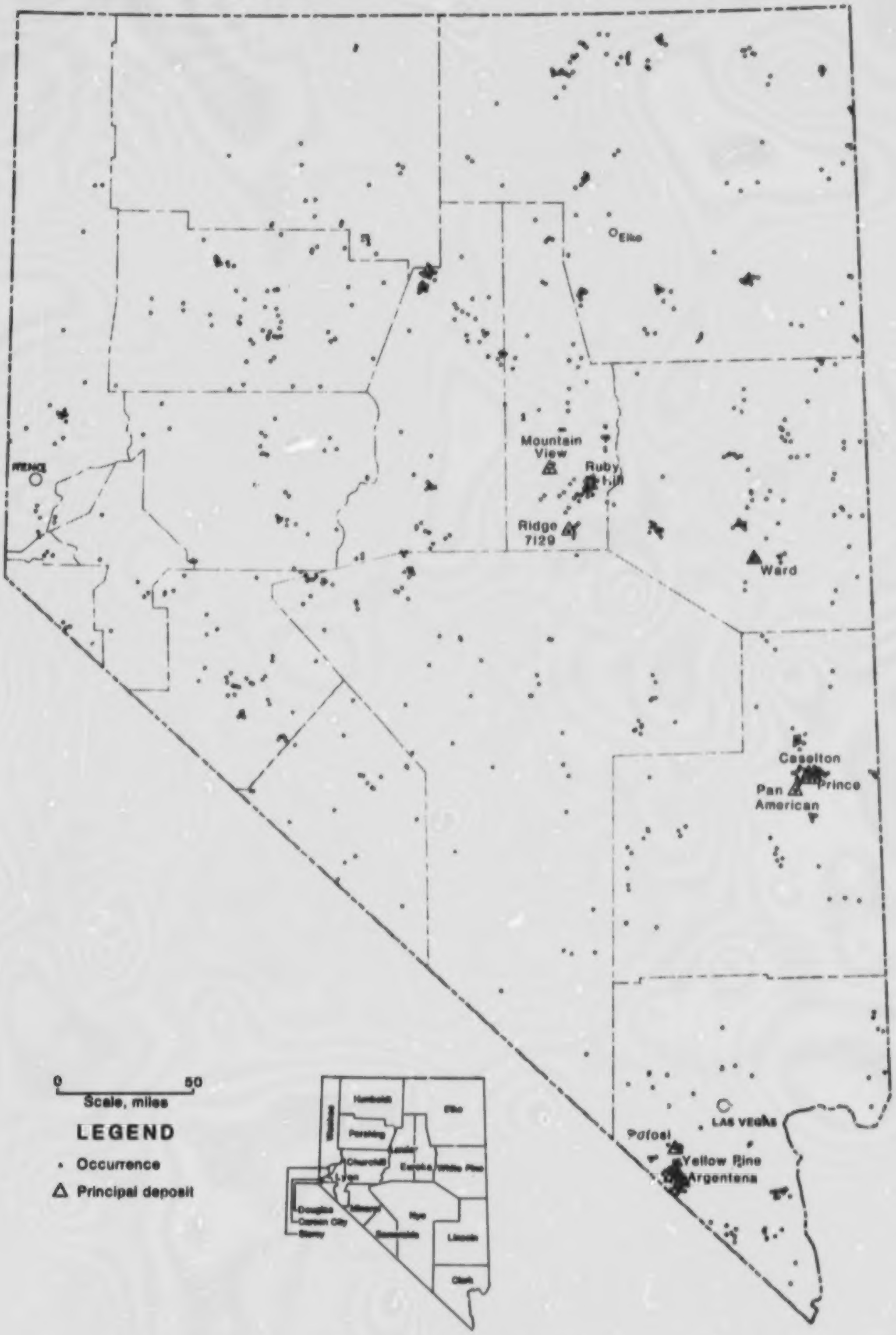
Elko
RENO
Mountain View
Ruby Hill
Ridge 7129
Ward
Caselton
Prince
Pan American
LAS VEGAS
Potosi
Yellow Pine
Argentena
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 20.—Lead-zinc in Nevada.

LITHIUM

Lithium is the lightest weight, lowest density, and most electrochemically reactive metal known. It finds use in a variety of commercial or industrial applications. The United States is the world's largest consumer of lithium and from 1978 through 1983, apparent domestic consumption averaged 2,833 t. In 1983, the aluminum industry, the largest lithium user, accounted for about one-third of domestic consumption. Other consuming industries include ceramic and specialty glass, lubricant, air conditioning, synthetic rubber, and primary batteries.

The United States is also the world's largest producer of lithium. In addition to supplying domestic needs, U.S. producers provide about 70% of market-economy countries supply of lithium. Approximately three-fourths of U.S. output is obtained from pegmatite deposits in North Carolina. The remainder is from lithium-bearing brines in Clayton Valley, NV. Currently, there is significant exploration activity in the McDermitt Caldera area near the Nevada-Oregon border where an extensive deposit of hectorite, a lithium-bearing clay, occurs.

Bureau of Mines Mineral Industry Location System (MILS) Data—Lithium in Nevada

Total properties	2
Producers[1]	1
Known principal deposits	2
Deposit abstracts in directory	2

[1] Includes past producers.

Reported Lithium Production—United States and Nevada, 1978–83 (*722–723*)

Lithium production data for both the United States and Nevada are withheld to avoid disclosing company proprietary data.

Principal Known Lithium Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	wt %	Year	Reference
Montana Mountains[3]	Humboldt	Explored	Li, U	Large	(4)	(4)	NAp	NAp
Silver Peak[3]	Esmeralda	Producer	Li	...do...	41	(5)	1979	638

NAp Not applicable.

[1] Based on estimate of metric tons of contained LiO_2: Large, >100,000; medium, 10,000 to 100,000; small, <10,000.

[2] Rounded.

[3] Deposit abstract in directory.

[4] No published data have been located.

[5] Li as Li_2CO_3.

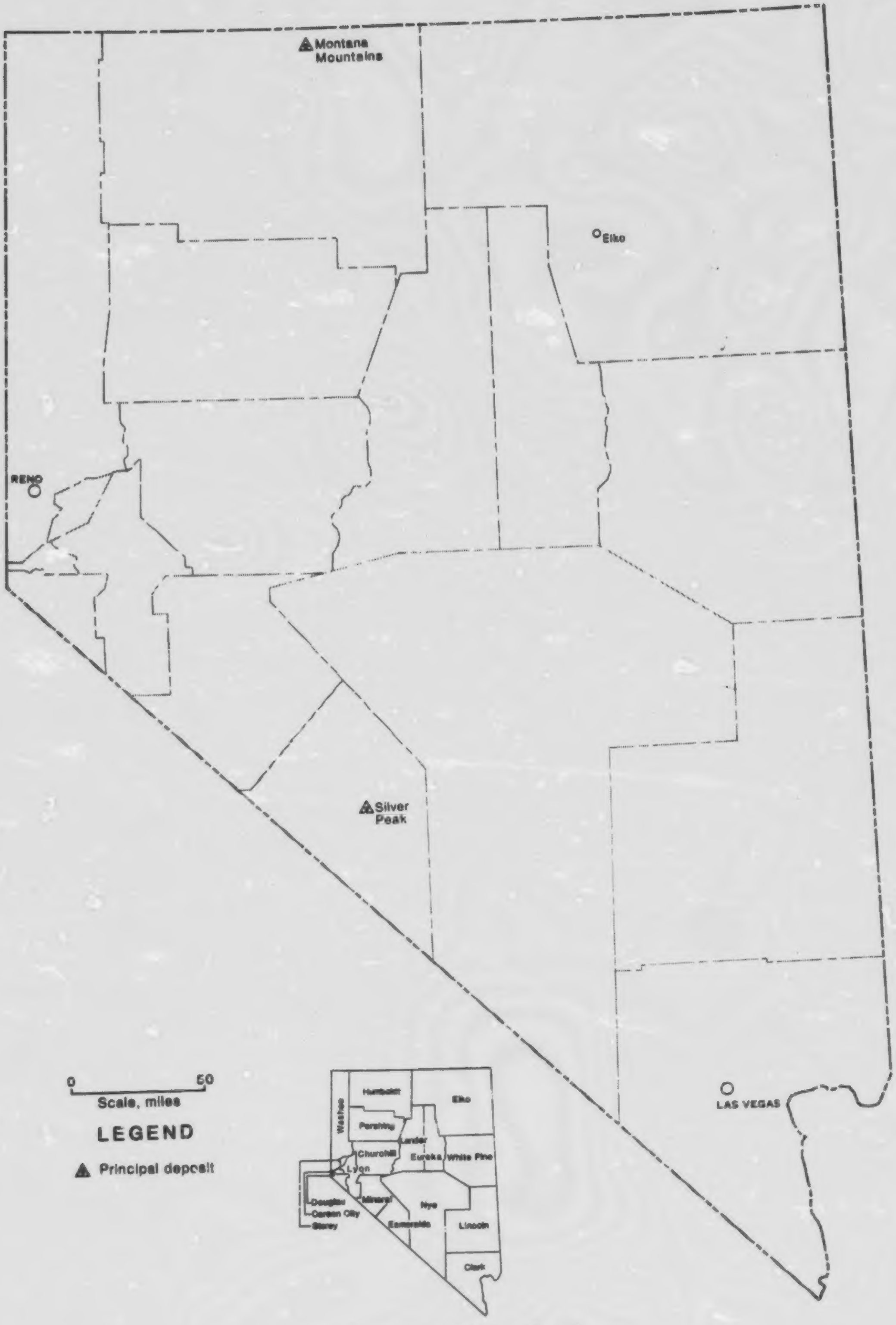
Montana Mountains
Elko
RENO
Silver Peak
LAS VEGAS
0
50
Scale, miles
LEGEND
Principal deposit
Humboldt
Elko
Washoe
Pershing
Churchill
Lander
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 21.—Lithium in Nevada.

MAGNESIUM

Magnesium, the eighth most abundant element in the Earth's crust, has two basic commercial forms: magnesium metal and magnesium compounds. Apparent U.S. annual consumption of magnesium metal averaged 111,000 t from 1978 through 1983, and for the same period, apparent annual domestic consumption of magnesium compounds averaged nearly 705,000 t (magnesium content). In 1983, about 53% of consumption of metallic magnesium was in the production of aluminum-based alloys. Other uses of the metal included magnesium castings and wrought products; reducing agents for titanium, zirconium, uranium, and beryllium metal; cathodic protection; and production of nodular cast iron. About 80% of the magnesium compounds used in the United States is in the form of magnesia (MgO) for high-temperature, basic refractory materials. The steel industry, the largest consumer of magnesia refractories, uses about 5.5 kg of MgO per metric ton of steel ingot produced. Magnesium compounds are also used in the production of a variety of other industrial and consumer goods including such diverse products as pulp and paper, sugar, rubber, chemicals, pharmaceuticals, fertilizers, textiles, glass, paint, cements, and ceramics.

In the United States, magnesium metal and magnesium compounds are recovered from seawater, well and lake brines, dolomite, brucite, and magnesite.

Prior to World War II, Nevada produced minor amounts of magnesium compounds; however, in the early 1940's production of magnesia greatly expanded principally for feed to the Government-built magnesium metal plant near Henderson, NV. All of the ore was obtained from deposits near Gabbs in Nye County. Magnesite mining for the production of refractory grade magnesia began in 1949 and has been carried out since.

Bureau of Mines Mineral Industry Location System (MILS) Data—Magnesium in Nevada

Total properties	35
Producers[1]	2
Known principal deposits	2
Deposit abstracts in directory	2

[1] Includes past producers.

Reported Magnesium Production[1]—United States and Nevada, 1978–83 (*722–723*)

Year	United States		Nevada	
	[2]10³ t	Value, 10³	10³ t	Value, 10³
1978	1,378	$221,626	W	W
1979	1,428	234,306	W	W
1980	1,297	277,506	W	W
1981	1,114	262,265	W	W
1982	915	222,287	W	W
1983	935	216,765	W	W

W Withheld to avoid disclosing company proprietary data.

[1] Magnesium compounds shipped and used.

[2] Rounded.

Principal Known Magnesium Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10³ t	wt %	Year	Reference
Basic, Inc.[3]	Nye	Producer	MgO	Large	24,500	[4]<5	1956	749
Overton[3]	Clark	Explored	MgO	Medium	([5])	([5])	NAp	NAp

NAp Not applicable.

[1] Based on estimate of metric tons contained MgO: Large, >10 million; medium, 100,000 to 10 million; small, <100,000.

[2] Rounded.

[3] Deposit abstract in directory.

[4] Wt % CaO.

[5] No published data have been located.

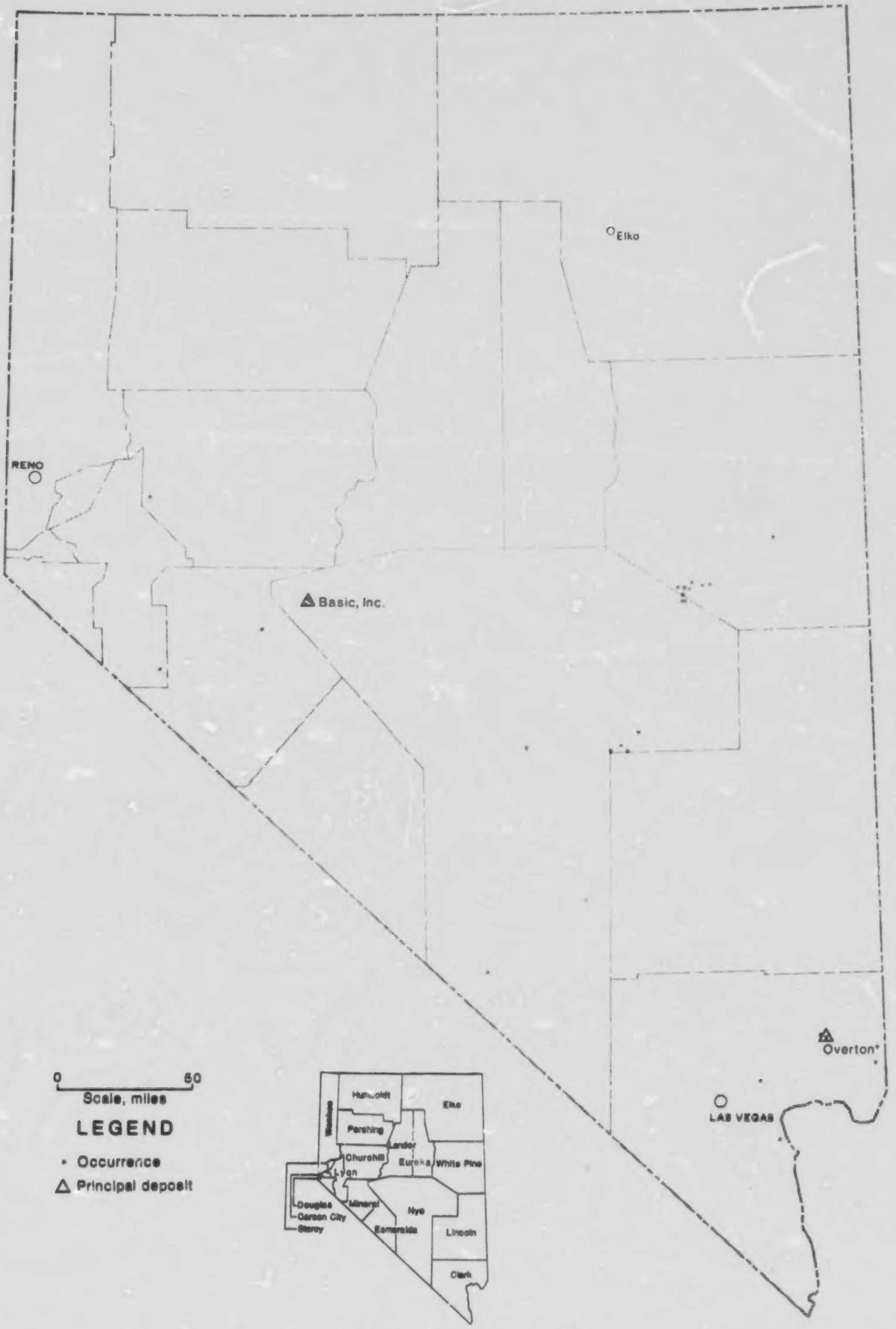
Elko
RENO
Basic, Inc.
Overton
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 22.—Magnesium in Nevada.

MANGANESE

Manganese, an extremely critical material in an industrial economy, is essential in the production of virtually all steels and pig iron. When added to the melt in small amounts (approximately 6.8 kg/t), manganese acts as a scavenger by combining with oxygen and sulfur to form easily removable slag. When added in larger amounts (10% to 14%), manganese imparts a work hardening characteristic to steel without sacrificing other desired properties. Manganese added to aluminum, magnesium, and copper increases strength, hardness, and/or corrosion resistance. Other uses of manganese include the production of dry cell batteries and chemicals.

The United States is almost totally dependent on imports to satisfy domestic manganese demand. Between 1978 and 1982, net U.S. import reliance ranged from 97% to 99% of domestic consumption. During war or other periods of artificially high prices, however, domestic mines have produced high-grade manganese ore or concentrates (>35% manganese). The Three Kids Mine in Clark County, the largest manganese producer in Nevada, is reported to have yielded more than 600,000 t of concentrates averaging about 45% manganese (*727*). Other major manganese past producers in Nevada include the Black Diablo Mine in Pershing County and the Caselton and Pioche No. 1 and 2 in Lincoln County. There has been no reported manganese production in Nevada since 1961.

Bureau of Mines Mineral Industry Location System (MILS) Data—Manganese in Nevada

Total properties	209
Producers[1]	69
Known principal deposits	5
Deposit abstracts in directory	5

[1] Includes past producers.

Reported Manganese Production[1]—United States and Nevada, 1978–83 (*722–723*)

Year	United States		Nevada	
	t	Value, 10^3	t	Value, 10^3
1978	34,723	$3,074	NRP	NRP
1979	27,998	2,902	NRP	NRP
1980	20,553	2,444	NRP	NRP
1981	22,067	2,890	NRP	NRP
1982	3,614	293	NRP	NRP
1983	3,335	216	NRP	NRP

NRP No reported production.

[1] Manganese content of manganiferous ore (5% to 35% Mn, natural) shipped. Shipments are used as a measure of manganiferous ore production. No manganese ore (35% or more Mn, natural) was reported shipped from 1978 through 1983.

Principal Known Manganese Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2] 10^3 t	wt %	Year	Reference
Boulder City[3]	Clark	Explored	Mn	Medium	13,600	3	1949	407
Fannie Ryan[3]	do	do	Mn	Small	23	7.6	1949	407
Gibellini[3]	Eureka	do	Mn, Ni, Zn	do	([4])	([4])	NAp	NAp
Three Kids[3]	Clark	Past producer	Mn	Large	7,230	13.2	1982	351
Virgin River[3]	do	Expored	Mn	do	290	10	1949	407

[1] Based on estimate of metric tons of contained Mn: Large, >1 million; medium, 100,000 to 1 million; small, <100,000.

[2] Rounded.

[3] Deposit abstract in directory.

[4] No published data have been located.

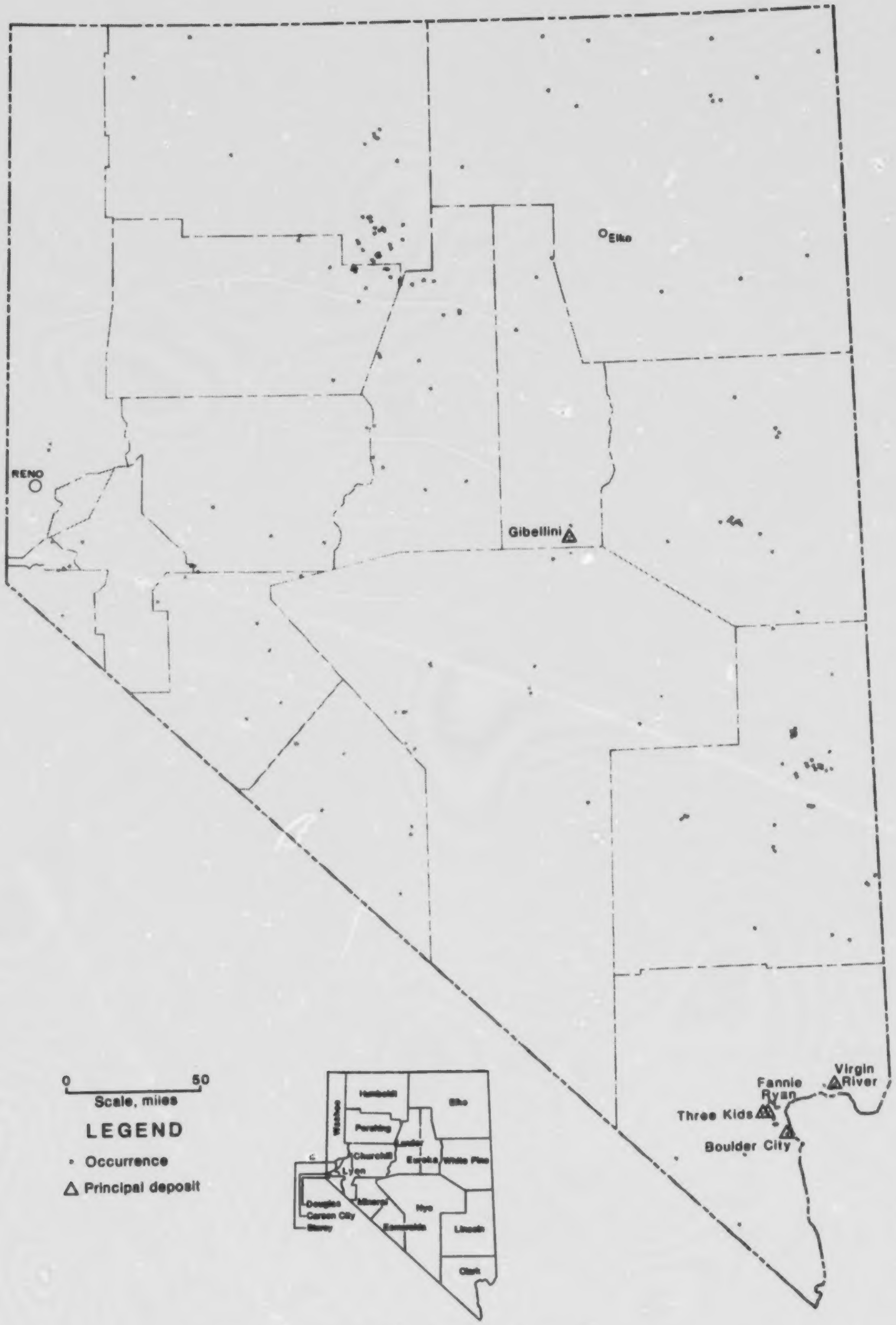
Elko
RENO
Gibellini
Virgin River
Fannie Ryan
Three Kids
Boulder City
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 23.—Manganese in Nevada.

MERCURY

Mercury possesses a combination of useful properties, namely, liquidity at ordinary temperatures, chemical stability, good electrical conductivity, high density and surface tension, uniform volume expansion, toxicity of its compounds for use in fungicides and other pesticides, and an ability to alloy readily. This latter property in particular, resulted in mercury having an important role in Nevada's early mining history. At one time, cinnabar was widely mined throughout the State and mercury, recovered by retorting, was used in early day gold mine operations to recover free gold and silver from placer and lode ores. This practice all but disappeared when free-milling ores were depleted and the cyanide process was developed. Today, over half of domestic mercury consumption is used in electrical apparatus. Other areas of principal use are in the electrolytic production of chlorine and caustic soda, mildew-proofing paint, and in industrial and control instruments.

Bureau of Mines Mineral Industry Location System (MILS) Data—Mercury in Nevada

Total properties	283
Producers[1]	124
Known principal deposits	4
Deposit abstracts in directory	3

[1] Includes past producers.

In recent years, Nevada has been the largest producer of primary mercury in the United States. In 1983, the State was the Nation's sole producer. Placer U.S. Inc.'s McDermitt Mine accounted for 99.8% of U.S. total mercury mine production in 1982, or 85% of total domestic mine and secondary mercury production. In 1983, Nevada supplied the nation with about 50% of the 50,000 flasks reported consumed. Although the bulk of mercury is produced from the McDermitt Mine, the Carlin, Pinson, and Borealis gold mines produce small quantities of mercury as a byproduct of gold refining. When the Paradise Peak gold mine commences production in the near future, about 90 t or 2,600 flasks of mercury is expected to be produced annually. An additional unknown quantity of mercury will be produced at the proposed Gold Quarry gold mine.

Reported Mercury Production—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	Flasks	Value, 10^3	Flasks	Value, 10^3
1978	24,163	$3,705	24,163	$3,705
1979	29,519	8,299	29,368	8,256
1980	30,657	11,939	30,431	11,851
1981	27,904	11,549	27,819	11,514
1982	25,760	W	25,760	W
1983	25,070	W	25,070	W

W Withheld to avoid disclosing company proprietary data.

Principal Known Mercury Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	kg/t	Year	Reference
B & B[3]	Esmeralda	Inactive-past producer	Hg, Sb	Small	(4)	(4)	NAp	NAp
Carson River[3]	Carson City	Inactive-Comstock wastes.	Hg, Au, Ag	Medium	(4)	(4)	NAp	NAp
McDermitt[3]	Humboldt	Active-producer	Hg	do	1,202	4.44	1982	564
Pilot Mountain district	Mineral	Inactive-past producer	Hg	Small-medium	(4)	(4)	NAp	NAp

NAp Not applicable.

[1] Based on estimate of flasks of contained Hg: Large, >500,000; medium, 500,000 to 10,000; small, <10,000.

[2] Rounded.

[3] Deposit abstract in directory.

[4] No published data have been located.

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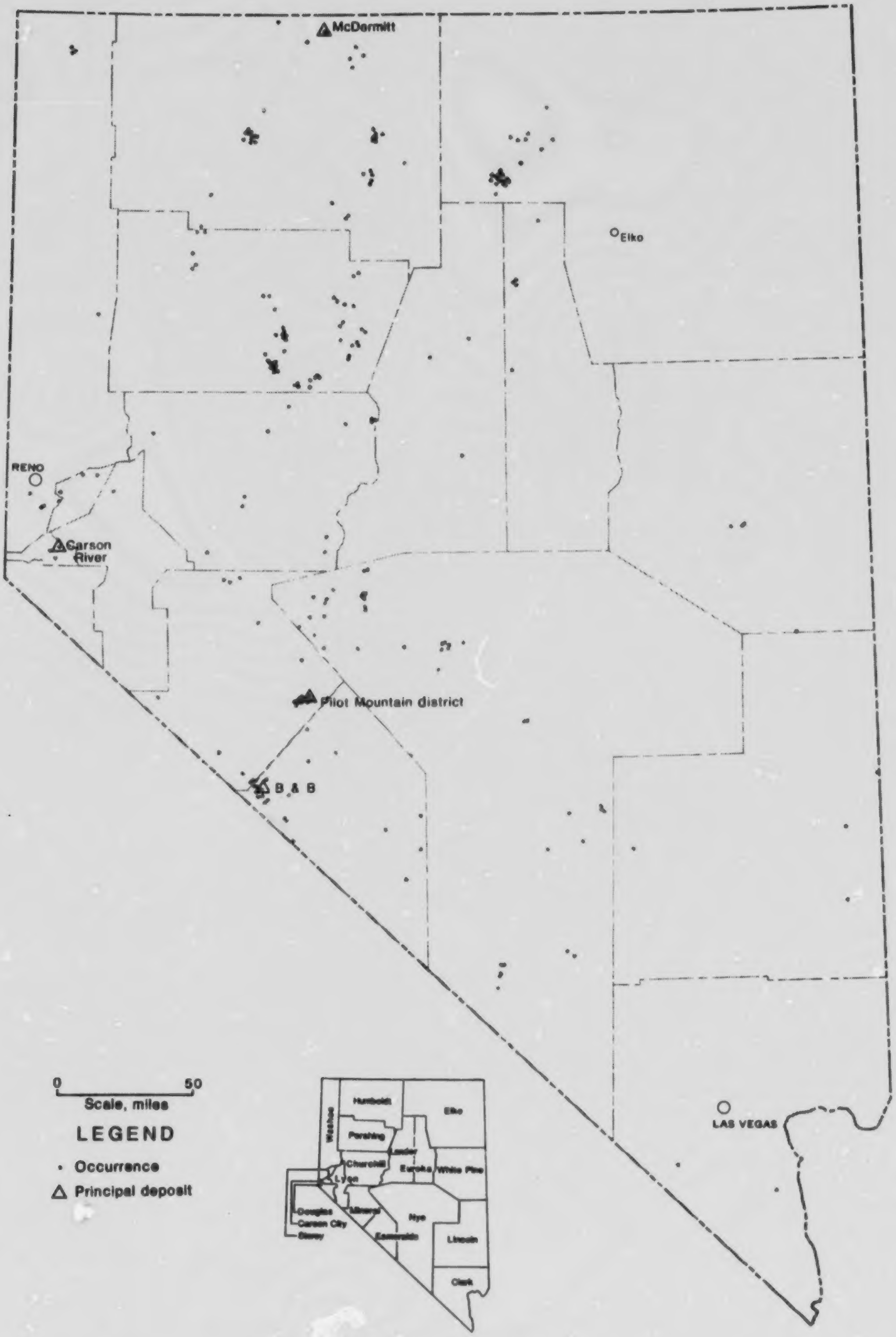
McDermitt
Elko
RENO
Carson River
Pilot Mountain district
B & B
LAS VEGAS
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 24.—Mercury in Nevada.

MOLYBDENUM

Molybdenum, a silver-white metallic element, is used as an alloying agent, refractory metal, and in lubricants, catalysts, and pigments. The United States has consistently been the world's largest producer of molybdenum, accounting for about two-thirds of the world annual output from 1976 through 1981. In 1982, however, the U.S. share of world production declined to about 41%, when domestic mines produced an estimated 38,275,000 kg of molybdenum, down from 63,458,000 kg in 1981. In 1983 U.S. mine output declined by nearly 60% and accounted for less than 25% of world molybdenum production.

Bureau of Mines Mineral Industry Location System (MILS) Data—Molybdenum in Nevada

Total properties	162
Producers[1]	2
Known principal deposits	5
Deposit abstracts in directory	4

[1] Includes past producers.

Until 1980, the molybdenum produced in Nevada was as a byproduct of cooper ore. By the end of 1981, Nevada's first primary molybdenum mine, the Anaconda Minerals Co. Nevada Moly Mine, was on-stream; however, no shipments were made. The mine operated through mid-1982, when the mill was shut down for modifications. Although milling resumed in October, the operation was again shut down in January 1983 because of the worldwide oversupply of molybdenum. In September 1983, operations resumed at 60% capacity.

Reported Molybdenum Production—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	[1]10³ t	Value, 10³	[1]ton	Value, 10³
1978	60	$607,950	45	$469
1979	55	871,068	18	242
1980	66	1,344,161	NRP	NRP
1981	63	995,541	NRP	NRP
1982	38	504,089	W	W
1983	15	167,164	W	W

NRP No reported production.
W Withheld to avoid disclosing company proprietary data.
[1] Rounded.

Principal Known Molybdenum Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					10³ t	wt %	Year	Reference
B & C Springs[2]	Nye	Explored	Mo, Cu, Ag	Large	131,000	0.12	1983	710
Buckingham[2]	Lander	do	Mo, Ag, Cu, W	do	907,000	.06	1982	701
Mount Hope[2]	Eureka	Developing	Mo	do	408,000	[3].13-.32	1981	383
Nevada Moly[2]	Nye	Producer	Mo, Cu	do	455,000	.072 [4].068	1983	736
Pine Nut	Mineral	Explored	Mo, W	do	82,000	.06	1983	794

[1] Based on estimate of metric tons of contained Mo: Large, >200,000; medium, 5,000 to 200,000; small, <5,000.
[2] Deposit abstract in directory.
[3] Wt % MoS_2
[4] Wt % Cu.

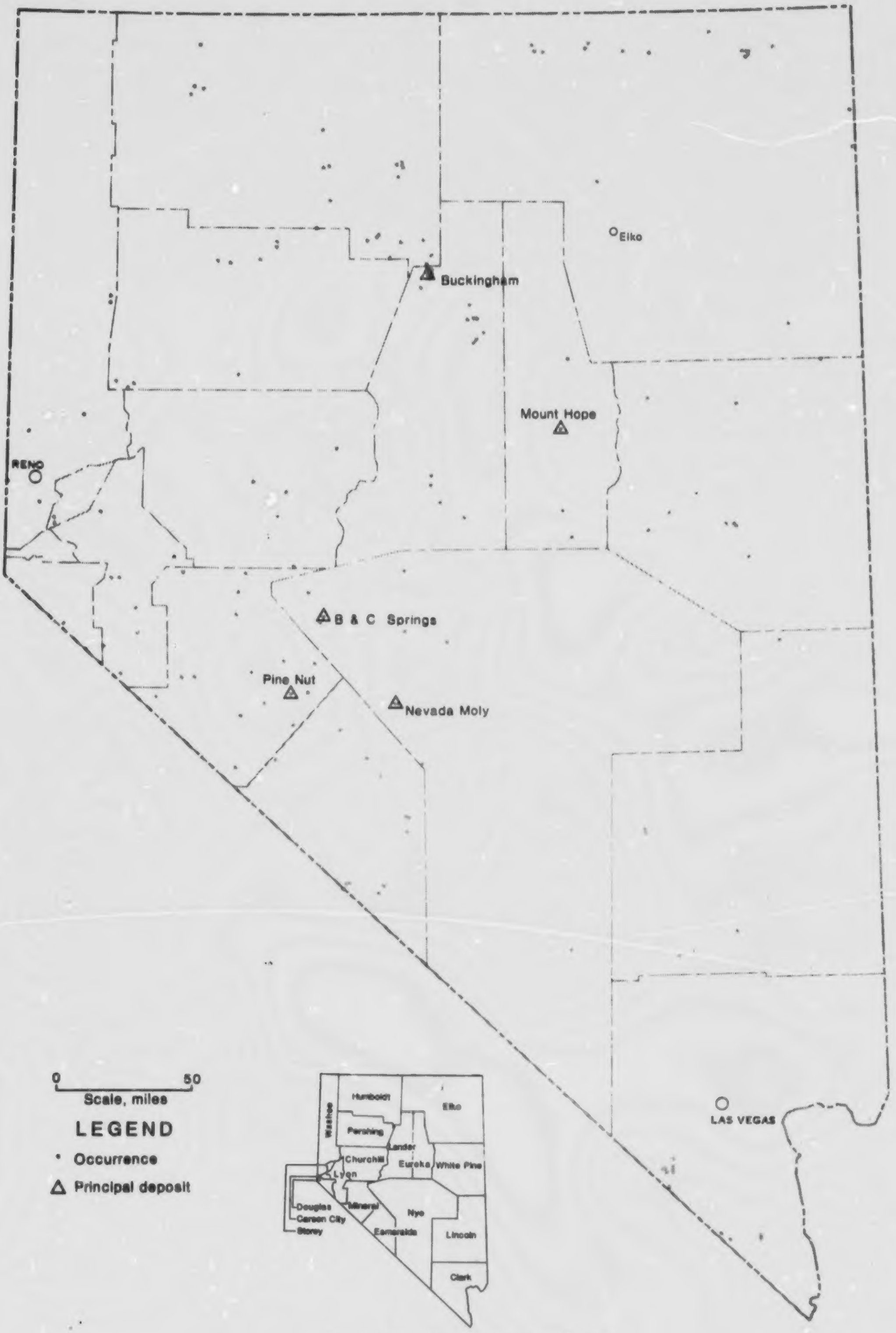
Buckingham
Elko
Mount Hope
RENO
B & C Springs
Pine Nut
Nevada Moly
LAS VEGAS
0
50
Scale, miles
LEGEND
Occurrence
Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Douglas
Carson City
Storey
Mineral
Nye
Esmeralda
Lincoln
Clark

Figure 25.—Molybdenum in Nevada.

SILVER

Both silver and gold have long been used as storehouses for wealth; however, silver possesses physical and chemical properties that also make it critical in producing many modern industrial and consumer products. Silver's unique properties include the highest electrical and thermal conductivity of all metals; the forming of photosensitive compounds; the resistance to oxidation at high temperatures while maintaining strength; and exceptional malleability and ductility. In 1982, U.S. consumers used about 4.66 million kg of silver while domestic mines yielded only slightly more than 1.25 million kg of primary metal or about 27% of apparent domestic consumption (*728*). Mines in Nevada contributed about 7.8% of the total domestic mine output and the State ranked fifth behind Idaho, Arizona, Montana, and Utah.

Nevada, the Silver State, earned its nickname early in its history when the rich ore bodies in the Comstock, Tonopah, and Eureka districts were discovered and mined. A recent revival in Nevada's silver mining industry began in 1979 in response to sharp increases in silver prices. Although industry activity slowed in 1981 and 1982, the revival had resumed momentum by 1983; the Sixteen-to-One commenced production in February 1982, and the Candelaria Mine, the Nation's largest open-pit silver mine, reopened in August 1983.

Nevada silver production is likely to increase over the next several years, especially if precious metal prices remain attractive. A major share of the increase will be from "byproduct" silver produced from Nevada's expanding gold mining industry. Several large gold mines are undergoing expansion and recent new discoveries may yield substantial silver. The Ward Mine should add a significant quantity of silver to the State's annual output when production commences after 1986.

Bureau of Mines Mineral Industry Location System (MILS) Data—Silver in Nevada

Total properties	2,479
Producers[1]	1,740
Known principal deposits	6
Deposit abstracts in directory	5

[1] Includes past producers.

Reported Silver Production—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	[1]10³ kg	Value, 10³	kg	Value, 10³
1978	1,225	$212,681	25,004	$4,341
1979	1,179	420,261	17,431	6,215
1980	1,006	666,955	29,237	19,392
1981	1,265	427,987	94,538	31,975
1982	1,252	319,902	97,735	24,981
1983	1,350	496,671	160,618	59,073

[1] Rounded.

Principal Known Silver Deposits in Nevada[1]

Deposit	County	Current status	Commodity	Size[2]	Published reserves-resources			
					[3]10³ t	g/t	Year	Reference
Candelaria[4]	Mineral	Active-producer	Ag, Au	Medium	16,800	37.4	1983	423
Gooseberry[4]	Storey	do	Ag, Au	Small	509	349 [5]8.9	1984	504
Mohawk	Esmeralda	do	Ag	do	180	480	1980	762
Rochester[4]	Pershing	Active-feasibility	Ag, Au	Medium	80,100	51 [5].24	1983	94
Sixteen-to-One[4]	Esmeralda	Active-producer	Ag, Au	Small	1,000	190 [5].96	1984	700
Taylor[4]	White Pine	do	Ag, Au	Medium	6,000	110	1983	637

[1] Many of Nevada's gold deposits also contain significant silver reserves-resources and with moderate price changes could be described as silver properties; many of these gold-silver deposits are listed under "Principal Known Gold Deposits in Nevada."

[2] Based on estimate of metric tons of contained Ag: Large, >10,000; medium, 10,000 to 500; small, <500.

[3] Rounded.

[4] Deposit abstract in directory.

[5] g/t Au.

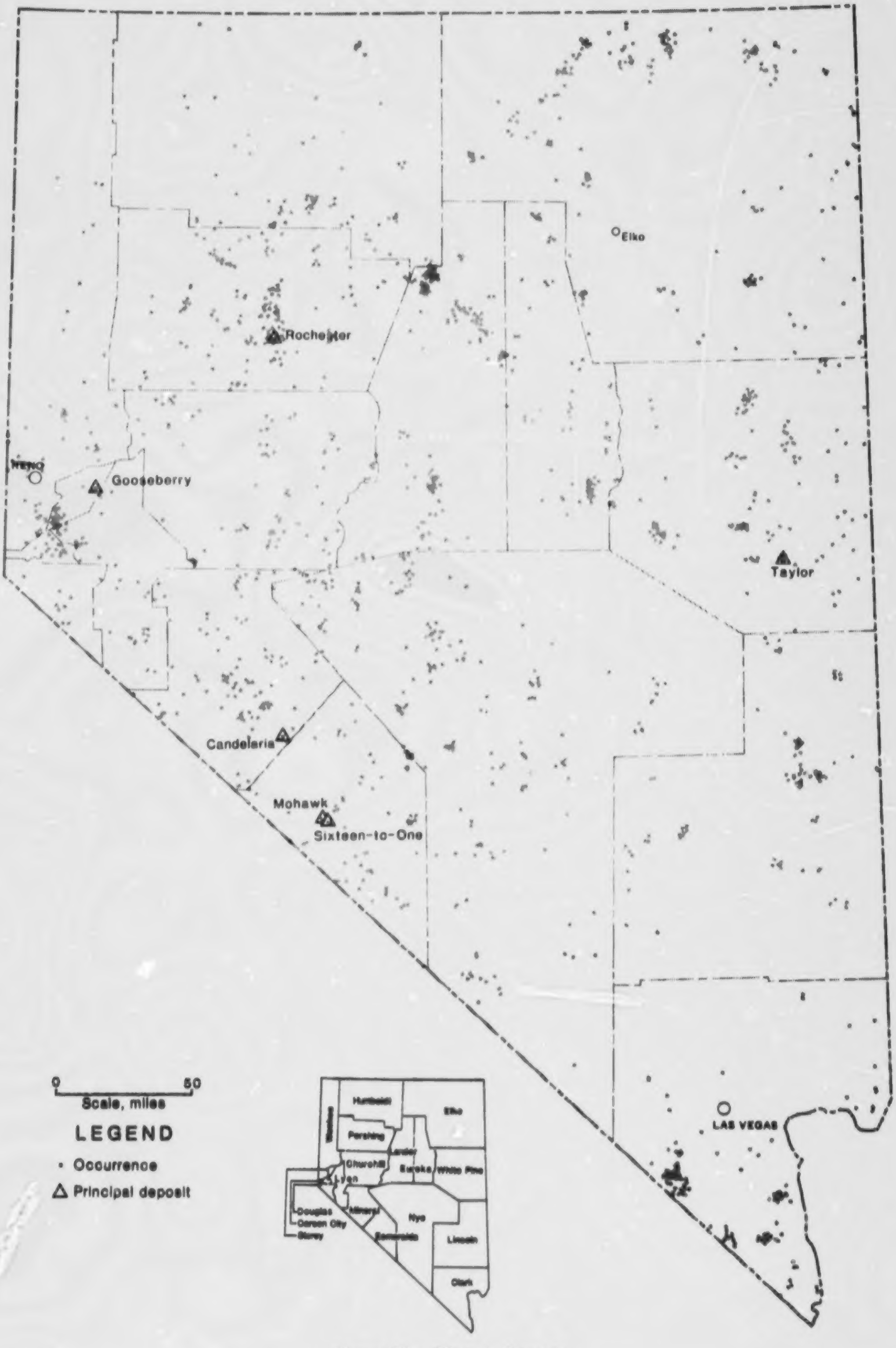
Reno
Gooseberry
Rochester
Elko
Taylor
Candelaria
Mohawk
Sixteen-to-One
Las Vegas
0
50
Scale, miles
LEGEND
· Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Mineral
Nye
Douglas
Carson City
Storey
Esmeralda
Lincoln
Clark

Figure 26.—Silver in Nevada.

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TUNGSTEN

Tungsten, vital to the defense industry, is essential for high-speed wear-resistant applications in most plant, mine, construction, and drilling operations, and for lamp filaments and many other pure metal uses. It is an important alloying element in tool steel. Approximately 95% of domestic tungsten production, up about 31% in 1981 from 1980 levels, came from two mines in California and one each in Colorado and Nevada. The Emerson Mine, Lincoln County, NV, was that State's largest producer, accounting for over 90% of production in 1981. The Emerson, Nevada Scheelite, Springer, Red Ant No. 2, Bobby No. 4, and Wells Tungsten reportedly produced in 1981. As of July 1983, tungsten production in Nevada was at a much lower level as a result of depressed tungsten market conditions. In 1984, the principal Nevada tungsten mines remain closed.

Bureau of Mines Mineral Industry Location System (MILS) Data—Tungsten in Nevada

Total properties	597
Producers[1]	321
Known principal deposits	14
Deposit abstracts in directory	8

[1] Includes past producers.

Reported Tungsten Production[1]—United States and Nevada, 1978–83 (*728–729*)

Year	United States		Nevada	
	[2]10^3 kg	Value, 10^3	[2]10^3 kg	Value, 10^3
1978	3,130	$56,961	119	$1,687
1979	3,014	55,785	W	W
1980	2,738	50,575	W	W
1981	3,545	62,231	W	W
1982	1,575	22,062	W	W
1983	1,016	10,528	W	W

W Withheld to avoid disclosing company proprietary data.

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2] Rounded.

Principal Known Tungsten Deposits in Nevada

Deposit	County	Current status	Commodity	Size[1]	Published reserves-resources			
					[2]10^3 t	wt %	Year	Reference
Desert Scheelite	Mineral	Past producer	W	Small	(3)	(3)	NAp	NAp
Emerson[4]	Lincoln	Standby	W, Mo, Zn, CaF_2, U	Large	(3)	(3)	NAp	NAp
Garnet-Tennessee Mountain.[4]	Elko	Past producer	W, Mo	Medium	359	[5]0.42	1977	526, 527
Granite Creek	Humboldt	do	W, Mo	Small	(3)	(3)	NAp	NAp
Gunmetal[4]	Mineral	do	W, Mo, Au	Large	(3)	(3)	NAp	NAp
Indian Springs[4]	Elko	Developed	W	do	12,610 39,000	[5].265 [5].164	1970	147
Linka[4]	Lander	Past producer	W, Mo	Small	(3)	(3)	NAp	NAp
Monte Cristo	White Pine	Explored prospect	W, Mo	Large	(3)	(3)	NAp	NAp
Nevada Scheelite[4]	Mineral	Past producer	W, Cu, Mo	do	(3)	(3)	NAp	NAp
Riley	Humboldt	do	W, Cu, Zn, Pb	Small	(3)	(3)	NAp	NAp
Riley Extension	do	do	W, Cu, Zn, Pb	do	(3)	(3)	NAp	NAp
Springer[4]	Pershing	Standby	W, Mo	Large	(3)	(3)	NAp	NAp
Tonopah[4]	Humboldt	Past producer	W, Cu, Mo	Medium	(3)	(3)	NAp	NAp
Wells	Elko	Producer	W	Small	(3)	(3)	NAp	NAp

NAp Not applicable.

[1] Based on estimate of metric tons of contained W: Large, >10,000; medium, 500 to 10,000; small, <500.

[2] Rounded.

[3] No published data have been located.

[4] Deposit abstract in directory.

[5] Wt % WO_3.

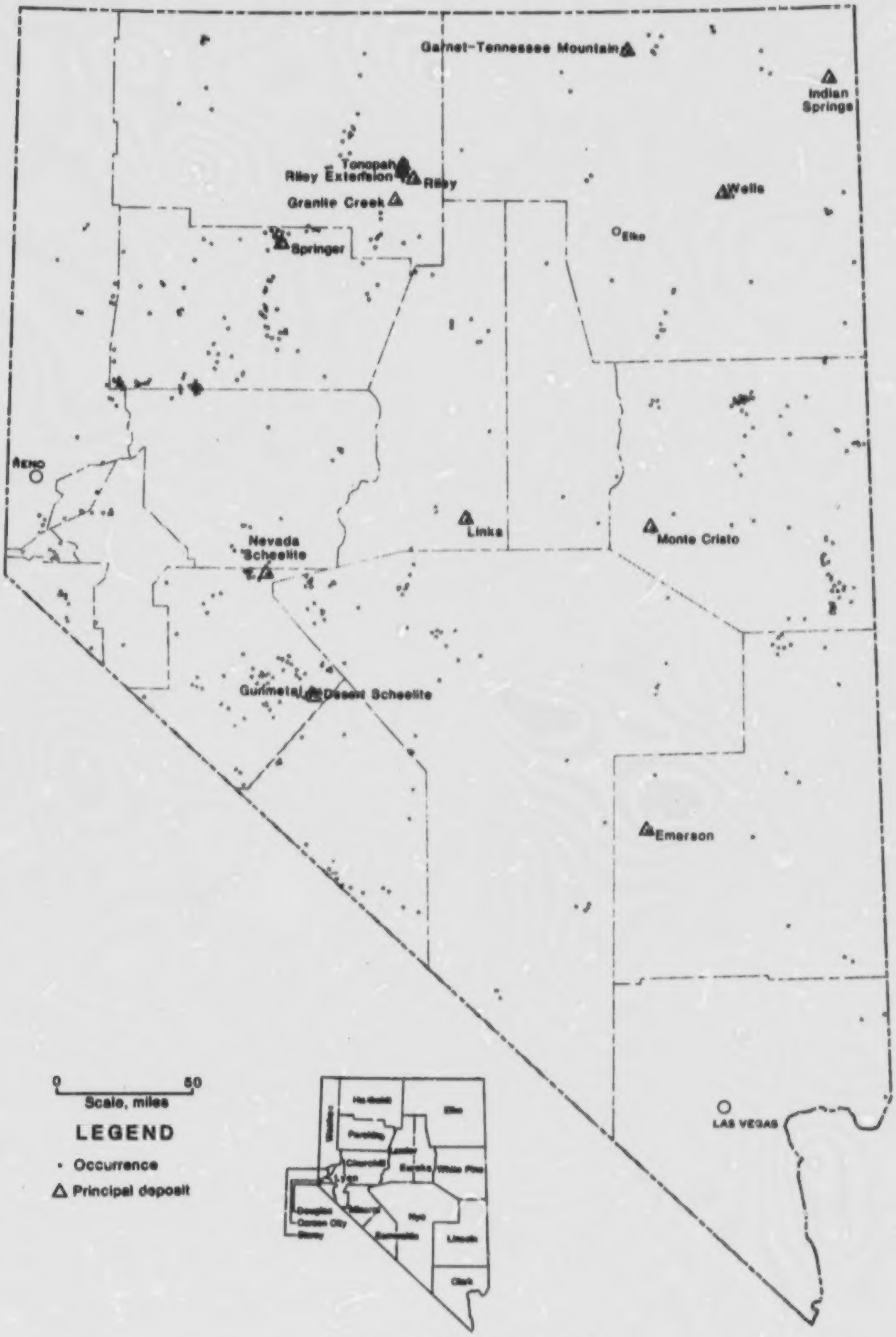
Garnet-Tennessee Mountain
Indian Springs
Tonopah
Riley Extension
Riley
Granite Creek
Wells
Elko
Springer
Reno
Nevada Scheelite
Links
Monte Cristo
Gunmetal
Desert Scheelite
Emerson
Las Vegas
0
50
Scale, miles
LEGEND
• Occurrence
△ Principal deposit
Humboldt
Elko
Washoe
Pershing
Lander
Churchill
Eureka
White Pine
Lyon
Mineral
Nye
Douglas
Carson City
Storey
Esmeralda
Lincoln
Clark

Figure 27.—Tungsten in Nevada.

ABSTRACTS OF SELECTED DEPOSITS IN NEVADA

As previously described, the heart of this publication consists of single-page, site-specific deposit abstracts for 119 selected deposits in Nevada. Figure 28 and table 9 serve as an index for the deposit abstract section.

TABLE 9.—Deposit abstract index

(Refer to figure 28)

Map No.	Deposit name	(1)
1..	Indian Springs	W
2..	Easy Miner	$BaSO_4$
3..	Snoose	$BaSO_4$
4..	Big Ledge	$BaSO_4$
5..	Stormy Creek	$BaSO_4$
6..	Jungle	$BaSO_4$
7..	Garnet-Tennessee Mountain.	W
8..	McDermitt	Hg
9..	Montana Mountains	Li
10.	Enfield Bell	Au
11.	Lakes	$BaSO_4$
12.	Fish Creek	$BaSO_4$
13.	Heavy Spar	$BaSO_4$
14.	Gold Quarry	Au
15.	Maggie Creek	Au
16	Carlin	Au
17.	Bullion Monarch	Au
18.	Blue Star	Au
19.	Goldstrike	Au
20.	Bootstrap	Au
21.	Dee	Au
22.	Queen Lode	$BaSO_4$
23.	Rossi	$BaSO_4$
24.	Getchell	Au
25.	Tonopah	W
26.	Pinson	Au
27.	Preble	Au
28.	Springer	W
29.	Bloody Canyon	Sb
30.	Rochester	Ag
31.	Relief Canyon	Au
32.	Sutherland	Sb
33.	Hollywood	Sb
34.	Dodge-Ford	Fe
35.	Fencemaker	Sb
36.	Buena Vista	Fe
37.	Piute	Fe
38.	Rain	Au
39.	Argenta	$BaSO_4$
40.	Battle Mountain Copper Basin.	Cu
41.	Buckingham	Mo
42.	Battle Mountain Copper Canyon.	Au
43.	Mountain Springs	$BaSO_4$
44.	Greystone	$BaSO_4$
45.	Modarelli	Fe
46.	Buckhorn	Au
47.	Horse Canyon	Au
48.	Tonkin Springs	Au
49.	Mount Hope	Mo
50.	Victoria	Cu
51.	Bald Mountain	Au
52.	Alligator Ridge	Au
53.	Ruby Hill	Pb-Zn
54.	Windfall	Au
55.	Bisoni	CaF_2
56.	Gibellini	Mn
57.	Ridge 7129	Zn
58.	Linka	W
59.	Antimony King	Sb
60.	Dry Canyon	Sb
61.	Hard Luck-Pradier	Sb
62.	Bray-Beulah	Sb
63.	Gooseberry	Ag
64.	Dayton	Fe
65.	Carson River	Hg
66.	Minnesota	Fe
67.	McArthur	Cu
68.	Ann Mason	Cu
69.	Yerington	Cu
70.	Bear	Cu
71.	Pumpkin Hollow	Fe
72.	Calico Hills	Fe
73.	Bell Mountain	Au
74.	Nevada Scheelite	W
75.	Phelps-Stokes	Fe
76.	Basic, Inc.	MgO
77.	B & C Springs	Mo
78.	Santa Fe	Au
79.	Borealis	Au
80.	Aurora	Au
81.	Gunmetal	W
82.	Candelaria	Ag
83.	B & B	Hg
84.	P & S	$BaSO_4$
85.	Northumberland	Au
86.	Ann	$BaSO_4$
87.	East Northumberland.	$BaSO_4$
88.	Kay	$BaSO_4$
89.	Round Mountain	Au
90.	White Caps	Sb
91.	Manhattan	Au
92.	Nevada Moly	Mo
93.	Tonopah Divide	Au
94.	Tonopah Hasbrouck	Au
95.	Silver Peak	Li
96.	Sixteen-to-One	Ag
97.	Goldfield	Au
98.	Crowell	CaF_2
99.	Sterling	Au
100	McGill Tailings	Cu
101	Robinson district	Cu
102	Ward	Pb-Zn
103	Taylor	Ag
104	Mount Wheeler	Be
105	White Pine	CaF_2
106	Atlanta	Au
107	Mammoth	CaF_2
108	Nyco	CaF_2
109	Rainbow	CaF_2
110	Caselton	Pb-Zn
111	Prince	Pb-Zn
112	Pan American	Pb-Zn
113	Emerson	W
114	C-M Alunite	Al
115	Overton	MgO
116	Virgin River	Mn
117	Fannie Ryan	Mn
118	Three Kids	Mn
119	Boulder City	Mn

Deposit name	(1)	Map No.
Alligator Ridge	Au	52
Ann	$BaSO_4$	86
Ann Mason	Cu	68
Antimony King	Sb	59
Argenta	$BaSO_4$	39
Atlanta	Au	106
Aurora	Au	80
B & B	Hg	83
B & C Springs	Mo	77
Bald Mountain	Au	51
Basic, Inc.	MgO	76
Battle Mountain Copper Basin.	Cu	40
Battle Mountain Copper Canyon.	Au	42
Bear	Cu	70
Bell Mountain	Au	73
Big Ledge	$BaSO_4$	4
Bisoni	CaF_2	55
Bloody Canyon	Sb	29
Blue Star	Au	18
Bootstrap	Au	20
Borealis	Au	79
Boulder City	Mn	119
Bray-Beulah	Sb	62
Buckhorn	Au	46
Buckingham	Mo	41
Buena Vista	Fe	36
Bullion Monarch	Au	17
C-M Alunite	Al	114
Calico Hills	Fe	72
Candelaria	Ag	82
Carlin	Au	16
Carson River	Hg	65
Caselton	Pb-Zn	110
Crowell	CaF_2	98
Dayton	Fe	64
Dee	Au	21
Dodge-Ford	Fe	34
Dry Canyon	Sb	60
East Northumberland.	$BaSO_4$	87
Easy Miner	$BaSO_4$	2
Emerson	W	113
Enfield Bell	Au	10
Fannie Ryan	Mn	117
Fencemaker	Sb	35
Fish Creek	$BaSO_4$	12
Garnet-Tennessee Mountain.	W	7
Getchell	Au	24
Gibellini	Mn	56
Gold Quarry	Au	14
Goldfield	Au	97
Gold Strike	Au	19
Gooseberry	Ag	63
Greystone	$BaSO_4$	44
Gunmetal	W	81
Hard Luck-Pradier	Sb	61
Heavy Spar	$BaSO_4$	13
Hollywood	Sb	33
Horse Canyon	Au	47
Indian Springs	W	1
Jungle	$BaSO_4$	6
Kay	$BaSO_4$	88
Lakes	$BaSO_4$	11
Linka	W	58
Maggie Creek	Au	15
Mammoth	CaF_2	107
Manhattan	Au	91
McArthur	Cu	67
McDermitt	Hg	8
McGill Tailings	Cu	100
Minnesota	Fe	66
Modarelli	Fe	45
Montana Mountains	Li	9
Mount Hope	Mo	49
Mount Wheeler	Be	104
Mountain Springs	$BaSO_4$	43
Nevada Moly	Mo	92
Nevada Scheelite	W	74
Northumberland	Au	85
Nyco	CaF_2	108
Overton	MgO	115
P & S	$BaSO_4$	84
Pan American	Pb-Zn	112
Phelps-Stokes	Fe	75
Pinson	Au	26
Piute	Fe	37
Preble	Au	27
Prince	Pb-Zn	111
Pumpkin Hollow	Fe	71
Queen Lode	$BaSO_4$	22
Rain	Au	38
Rainbow	CaF_2	109
Relief Canyon	Au	31
Ridge 7129	Zn	57
Robinson district	Cu	101
Rochester	Ag	30
Rossi	$BaSO_4$	23
Round Mountain	Au	89
Ruby Hill	Pb-Zn	53
Santa Fe	Au	78
Silver Peak	Li	95
Sixteen-to-One	Ag	96
Snoose	$BaSO_4$	3
Springer	W	28
Sterling	Au	99
Stormy Creek	$BaSO_4$	5
Sutherland	Sb	32
Taylor	Ag	103
Three Kids	Mn	118
Tonkin Springs	Au	48
Tonopah	W	25
Tonopah Divide	Au	93
Tonopah Hasbrouck	Au	94
Victoria	Cu	50
Virgin River	Mn	116
Ward	Pb-Zn	102
White Caps	Sb	90
White Pine	CaF_2	105
Windfall	Au	54
Yerington	Cu	69

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[1] Primary commodity.

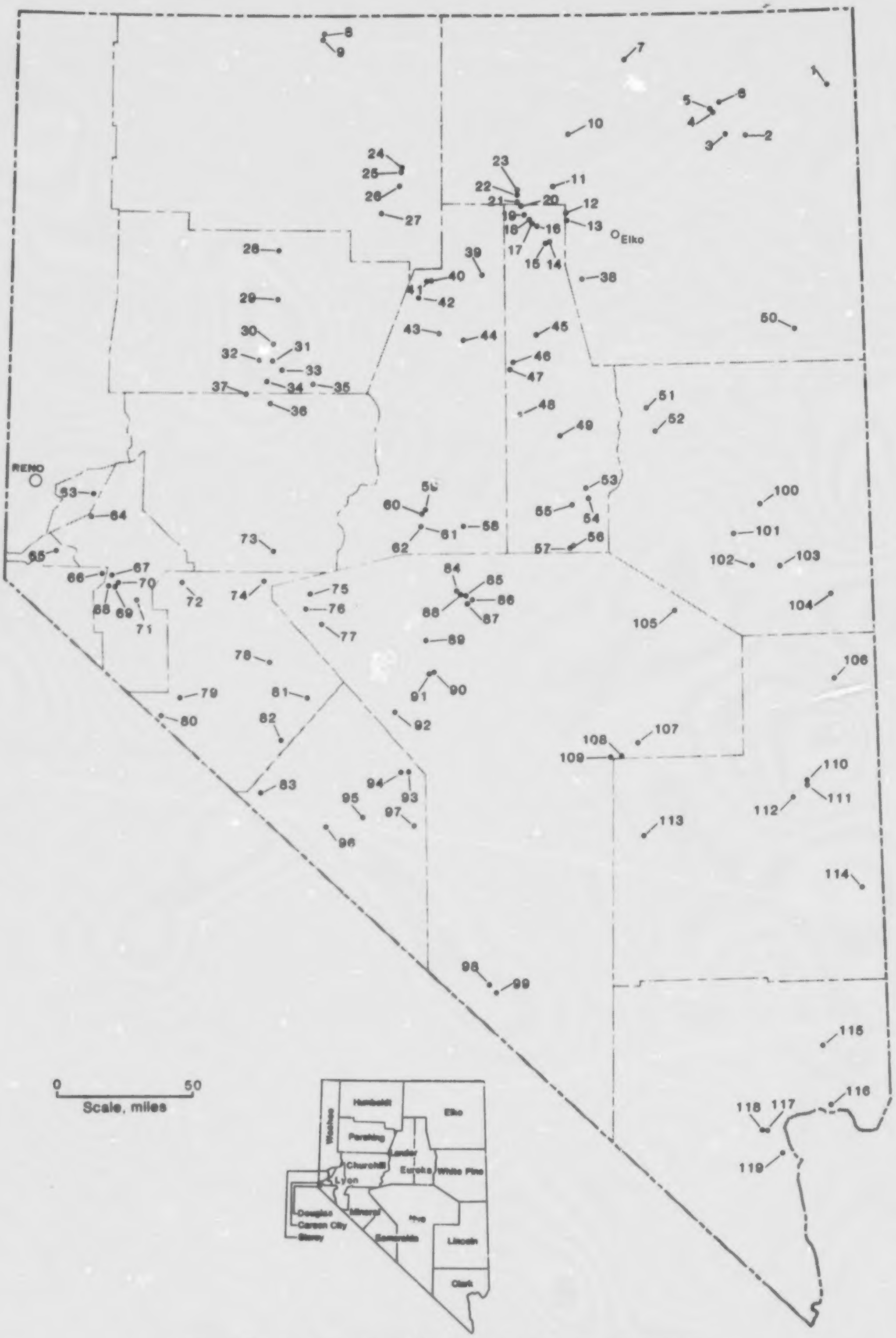
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Figure 23.—Location of principal deposits with deposit abstracts.

ALLIGATOR RIDGE—GOLD

Ore body names: Vantage 1, 2, and 3

Commodities: Au, Ag, Hg
(Au-Ag ratio = 9:1)

LOCATION-OWNERSHIP

County	White Pine.
Mining district	Buck Mountain (8 km north of mine).
Elevation	2,250 m.
Topography	Rugged.
Domain	Public, BLM-administered.

General location	About 50 km northeast of Eureka.
Meridian	Mount Diablo.
Tract	Sec. 1, T 22 N, R 57 E.
Latitude	39°48'24" N.
Longitude	115°31'12" W.

Owner	Amselco Minerals, Inc., Denver, CO (subsidiary of Selection Trust Ltd., London, England), 50%; NERCO Minerals Co., Fairbanks, AK (subsidiary of Pacific Power & Light Co., Portland, OR), 50% (1984).
Operator	Amselco Minerals, Inc. (1984).

GEOLOGY[1]

Type of ore body	Disseminated; stratabound.
Origin	Hydrothermal.
Shape of ore body	Irregular.
Ore controls	Bedding; faulting.
Strike and dip of mineralized zone.	N 20° E: nearly horizontal.
Age of mineralization	Tertiary (5 to 30 million yr).
Mineralized zone average dimensions, m:	
Length	915.
Width	305.
Thickness	75.
Depth	120 (deepest ore body).

Mineral names .... Gold (coarse free and submicrometer free); oxide zone—specular hematite, jarosite, stibiconite, goethite, drusy quartz, barite, calcite, gypsum, alunite, kaolinite; carbonaceous ore—stibnite, pyrite, orpiment, realgar, calcite.

Host formation	Pilot Shale.
Geologic age	Mississippian.
Rock relationships	Siltstone, silicified-brecciated, contains ore. Siltstone, unaltered carbonaceous calcareous, is unaltered, unmineralized Pilot Shale. Limestone is above and below host rock.
Alteration	Jasperoid silicification, oxidation, decarbonatization.
Size	Medium.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit: 680,000-t/a capacity.
Year of discovery	June 1976.
Discovery method	Outcrop sampling.
Initial production	May 1981.
Past production	1,980.3 kg (63,668 tr oz) Au, 141.8 kg (4,558 tr oz) Ag (1981) (*133*). Total, 1.8 million t (2 million ton) ore with 3.91 g/t (0.114 tr oz/ton) leachable metal (1981-83) (*15*).
Annual production rate	About 1,900 kg Au (60,000 tr oz), 440 kg Ag (14,000 tr oz).

Distance to water supply	On-site wells, 180 m deep.
Road requirement	Amselco improved about 50 km of county road.
Distance to power supply	50- to 60-km powerline constructed.
Mill location	On-site.
Mill status	Active.
Milling method	Agglomeration, heap cyanide leaching, carbon adsorption, electrolysis, smelting.
Process rate	680,000 t/a (2,700 t/d).
Product type	Dore bullion bars; 92% Au, 6% Ag.
Distance shipped	About 700 km.
Destination	Anaheim, CA.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	14,000,000 tons	0.12 tr oz/ton Au	1981	61
2..Demonstrated	5,000,000 tons	0.12 tr oz/ton Au (average stripping ratio of 3.08:1; tons waste:tons ore).	1981	835
3..Proven	3,900,000 tons	0.092 tr oz/ton Au (stripping ratio = 3.5:1)	1983	15

REFERENCES

15, 61, 82, 83, 90, 111, 133, 163, 227, 284, 297, 298, 358, 378, 400, 412, 481, 565, 587, 681, 835.

USGS quad maps	Ely, 1:250,000. Cold Creek, 15'.
USBM sequence number	0320330470.
Mid number	2601624.

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[1] The deposit, as presently defined, consists of 4 separate but adjacent mineralized areas. Ore bodies are irregular but roughly circular in plan with widths of 100 to 200 m, lengths of 200 m, and thicknesses estimated at 40 to 50 m. Pilot Shale host is approximately 60 to 90 m thick but thins and disappears to the west and south. 1984 projected mine life is mid-1988.

ANN—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Nye.	General location	About 65 km southeast of Austin.
Mining district	Northumberland.	Meridian	Mount Diablo.
Elevation	2,500 m.	Tract	Sec. 28, T 13 N, R 46 E.
Topography	Rugged.	Latitude	38°55'40" N.
Domain	Federal; National forest.	Longitude	116°47'45" W.

Owner	W. B. Kohlmoos, N. S. Mallory, T. Corder (1983).
Operator	Dresser Industries, Dallas, TX (1983).

GEOLOGY

Type of ore body	Bedded replacement.	Host formation	Pinecone.
Origin	Sedimentary.	Geologic age	Devonian.
Shape of ore body	Irregular.	Rock relationships	Chert. Claystone, lies over ore. Mudstone.
Ore controls	Bedding.		
Strike and dip of mineralized zone.	N 40° E: 45° E.	Size	Medium.
Mineralized zone average dimensions, m.	Unknown.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Inactive-explored.	Distance to water supply	<3 km.
Type of operation	Possible surface.	Road requirement	<10 km.
		Distance to power supply	<10 km.
Year of discovery	1967.	Mill location	No mill.
Discovery method	Ore mineral in place.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

338, 357, 368, 546, 623, 624.

USGS quad maps	Tonopah, 1:250,000. Northumberland Pass, 7.5'.
USBM sequence number	0320230718.

ANN MASON—COPPER

Alternate names: None

Commodities: Cu, Mo

LOCATION-OWNERSHIP

County	Lyon.
Elevation	1,829 m.
Domain	BLM administered.

General location	About 58 km southeast of Carson City.
Meridian	Mount Diablo.
Tract	Sec. 13, T 13 N, R 24 E.
Latitude	38°59'03" N.
Longitude	119°14'47" W.

Owner	The Anaconda Minerals Co., Denver, CO (a wholly owned subsidiary of Atlantic Richfield Co., Denver, CO)(1984).

GEOLOGY

Type of ore body	Disseminated, porphyry copper.
Origin	Magmatic, hydrothermal.
Shape of ore body	Irregular.
Ore controls	Dikes, faulting.
Plunge and dip of mineralized zone.	West: gentle.
Age of mineralization	168 million yr.
Mineralized zone average dimensions, m:	
Length	2,360.
Thickness	+530.
Depth	90 to +240.
Mineral names	Chalcopyrite, pyrite, bornite, molybdenite, goethite, limonite, chrysocolla, hematite, quartz, K-feldspar, plagioclase, hornblende, biotite, magnetite, sphene, apatite, zircon, ilmenite, augite, chlorite, sericite.

Host formation	Yerington Batholith.
Geologic age	Jurassic.
Rock relationships	Quartz monzonite, encloses ore, gangue. Porphyrtic quartz monzonite, encloses ore, gangue. Granodiorite, encloses ore, gangue. Quartz monzonite porphyry dikes; highest ore grades occur near dikes. Tertiary volcanics; above ore on the north.
Alteration	Sodic-calcic, potassic, propylitic, sodic, sericitic.
Size	Large.

DEVELOPMENT

Current status	Inactive-explored prospect.
Type of operation	Prospect.
Year of discovery	1968.
Discovery method	Geophysical, drilling.
Initial production	No production.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. . Not reported in reference	495,000,000 tons	0.40% Cu	1976	829

REFERENCES

126, 128, 453, 567, 695, 822, 829.

USGS quad maps	Walker Lake, 1:250,000. Yerington, 15'.
USBM sequence number	0320190169.

Comments: Copper mineralization is contemporaneous with and spatially related to a swarm of quartz monzonite porphyry dikes that intrude into granodiorite and quartz monzonite. Mineralized zone dimensions are for >0.2% Cu.

ANTIMONY KING—ANTIMONY

Alternate names: Last Chance, Pine, Dry Canyon, Big Creek, Stokes, Mammoth, Mountain View, Commodore, Confidence

Commodities: Sb

LOCATION-OWNERSHIP

County	Lander.
Mining district	Big Creek.
Elevation	2,682 m.
Topography	Rugged.
Domain	Mixed.
Owner	Donald Colson (1984).
Lessee	FMC Corp., Reno, NV (1984).

General location	About 12 km southwest of Austin.
Meridian	Mount Diablo.
Tract	Sec. 26, T 18 N, R 43 E.
Latitude	39°23′27″ N.
Longitude	117°06′08″ W.

GEOLOGY

Type of ore body	Shear zone; fracture zone.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting; fracturing.
Strike and dip of mineralized zone.	N 55° W: 55° W.
Mineralized zone average dimensions, m:	
Length	200.
Width	40.
Thickness	2.
Depth	0.
Mineral names	Stibnite, pyrite.

Host formation	Valmy.
Geologic age	Ordovician.
Rock relationships	Shale, encloses ore. Limestone, encloses ore. Sandstone, near ore. Chert, near ore. Siltstone, near ore.
Size	Small.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Underground.
Year of discovery	1890.
Discovery method	Ore mineral in place.
Initial production	1907.
Last production	1970.
Past production	454 t Sb metal (*376*).

Distance to water supply	<10 km.
Road requirement	<50 km.
Distance to power supply	<50 km.
Mill location	No mill.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

376, 693.

USGS quad maps	Millett, 1:250,000. Austin, 15′.
USBM sequence number	0320150034.

Comments: Some production apparently combined with or reported as output from the Dry Canyon antimony mine.

ARGENTA—BARITE

Alternate names: Barium King, Milchem, Nevada Barite, Yuba-Shelton, Baryte No. 1, 3

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Lander.	General location	About 18 km east of Battle Mountain.
Mining district	Argenta.	Meridian	Mount Diablo.
Elevation	1,890 m.	Tract	Sec. 19, T 32 N, R 47 E.
Topography	Rugged.	Latitude	40°38'14" N.
Domain	Public; private.	Longitude	116°44'20" W.
Owner	Milchem, Inc., Battle Mountain, NV (1984).		

GEOLOGY

Type of ore body	Sedimentary.	Host formation	Slaven.
Origin	Sedimentation.	Geologic age	Devonian.
Shape of ore body	Tabular.	Rock relationships	Chert, lies over ore, encloses ore.
Ore controls	Bedding; lithology.	Size	Medium.
Strike and dip of mineralized zone.	N 10° E: 20° E.		
Mineralized zone average dimensions, m:			
Length	400.		
Width	170.		
Thickness	15.		
Depth	60.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Active-producer.	Distance to water supply	On-site.
Type of operation	Open pit.	Road requirement	None.
		Distance to power supply	On-site.
Initial production	1935.	Mill location	65 km north of mine.
Last production	1983.	Mill status	Active.
Past production	About 5,215,000 t barite mined to January 1982 (*385*).	Milling method	Crushing, jigging, grinding.
		Product type	Jigged and ground barite.
		Distance shipped	Gulf Coast, California, Wyoming, and Canada.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

87, 283, 330, 346, 385, 392, 546, 548, 601, 686, 693.

USGS quad maps	Winnemucca, 1:250,000. Dunphy, 15'.
USBM sequence number	0320150057.
Mid number	2600635.

Comments: Existing pit operations cover about 40.5 ha. The Argenta has been divided into 6 major areas for development, of which 2 are currently being stripped and mined.

ATLANTA—GOLD

Alternate names: Atlanta Home, Atlanta Strip, Hillside, Sparrow Hawk, Pactolion Fraction, Belle

Commodities: Au, Ag, minor U

LOCATION-OWNERSHIP

County	Lincoln.
Mining district	Atlanta.
Elevation	2,073 m.
Topography	Hilly.

General location	About 80 km northeast of Pioche.
Meridian	Mount Diablo.
Tract	Sec. 24, T 7 N, R 68 E.
Latitude	38°27′57″ N.
Longitude	114°19′18″ W.

Owner-operator	Standard Slag Co., Reno, NV (1984).
Owner	Bobcat Properties, Inc., Fort Lauderdale, FL (1984).

GEOLOGY

Type of ore body	Disseminated gold in shear-breccia zone.
Origin	Hydrothermal; open space filling of breccia zone.
Shape of ore body	Tabular (planet).
Ore controls	Faulting, silicification, brecciation.
Strike and dip of mineralized zone.	N 5° E: 45° W.
Age of mineralization	Tertiary.
Mineralized zone average dimensions (breccia zone), m:	
Length	200.
Width	250.
Mineral names	Gold (microscopic), silver (microscopic), limonite, quartz, manganese oxides, jasperoid, hematite, barite, clay.

Host formation	Ely Springs Dolomite (see comments).
Geologic age	Ordovician.
Rock relationships	Dolomite, massive dolomite below ore zone. Jasperoid breccia, portions are ore. Quartz porphyry, near ore, in places contains low-grade gold.
Alteration	Silicification, intense; kaolinitic argillization; alunitization.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit; multiple bench.
Year of discovery	About 1906; reactivated in 1974.
Initial production	1975 (Standard Slag).
Last production	Ongoing 1984.
Past production	May 1, 1975, to May 31, 1982: 2,500 kg (80,000 tr oz) Au, 12,000 kg (400,000 tr oz) Ag. Estimated total ore milled is 860,000 t (*680*).
Annual production rate	Estimated 400 kg (13,000 tr oz) Au and 2,000 kg (65,000 tr oz) Ag (*132*).

Distance to water supply	14 km.
Road requirement	Existing to site.
Distance to power supply	On-site, 26-km line.
Mill location	On-site.
Mill status	Active, producing.
Milling method	Cyanide leach, countercurrent decantation, Merrill-Crowe zinc precipitation, smelting.
Process rate	520 t/d (570 ton/d).
Product type	Bullion.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	1,100,000 tons	0.08 tr oz/ton Au; 1.6 tr oz/ton Ag	1980	61

REFERENCES

61, 102, 132, 207, 265, 288, 289, 393, 412, 617, 678, 680, 723, 724.

USGS quad maps	Lund, 1:250,000. Atlanta, 7.5′.
USBM sequence number	0320170169.
USGS MRDS number	M032067.
Mid number	2601143.

Comments: The Atlanta ore body carries disseminated submicroscopic gold and uranium within a breccia zone consisting of brecciated fragments of limestone (Ordovician-Ely Springs Dolomite), quartz porphyry, quartzite (Ordovician-Eureka Quartzite), volcanic rocks (possibly Tertiary-ignimbrites), jasperoid. Breccia is cemented chiefly by quartz. The ore zone has been intruded by quartz-porphyry and is bounded by 2 high-angle, west-dipping normal faults. Tertiary volcanic ignimbrites form the hanging wall; the Ely Springs Dolomite forms the footwall.

AURORA—GOLD

Patented claim names: Silver Lining Consolidated, Humboldt, Humboldt W., Astor, Alice C. Dennis
Alternate names: Humboldt East Claims, Humboldt West Claims

Commodities: Au, Ag

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Aurora.
Elevation	2,290 m.
Topography	Hilly.
Domain	Private.

General location	About 35 km north of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 17, T 5 N, R 28 E.
Latitude	38°12'23" N.
Longitude	118°53'16" W.

Owner-lessee	Electra North West Resources, Ltd., Vancouver, BC, Canada (1983).
Owner-lessee	Centennial Minerals, Ltd., Vancouver, BC, Canada (1983).
Operator	Centennial Exploration Corp. (1983).

(Portions of the property are leased from Hanna Mining Co. and from Houston International Minerals.)

GEOLOGY

Type of ore body	Fissure vein.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting.
Strike and dip of mineralized zone.	N 40° E: 60 to 70° W.
Age of mineralization	10 million yr.
Pit zone average dimensions (1983 plan), m:	
Length	490.
Width	60 to 120.
Depth	12 to 35.
Mineral names	Native gold, quartz, sulfides (sparse)

(typical mineralogy of ore veins has been quartz, adularia, argentiferous tetrahedrite, pyrite, chalcopyrite, and soft blue-gray material containing gold, and native gold).

Host formation	Volcanics.
Geologic age	Tertiary.
Rock relationships	Andesite, altered, encloses ore. Quartz, vein encloses ore, vein is ore.
Alteration (district)	Potassic, argillic, propylitic.
Size	Small.

DEVELOPMENT

Current status	Active-producer; developing.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	District discovery in 1860.
Discovery method	Unknown.
Initial production	June 1983 (planned).
Past production	The first dore was planned to be poured in July 1983. Planned production for 1983 was 77,000 t containing about 300 kg gold. Anticipated recovery was 70%. Total waste production planned was 200,000 t (*309*).

Distance to water supply	900 m, from abandoned underground workings.
Road requirement	No new access road required.
Distance to power supply	On-site diesel electric generation.
Mill location	On-site.
Mill status	Active-testing.
Milling method	Test cyanide heap leach, adsorption-desorption columns, electrolysis, smelting.
Process rate	90-t jaw and cone crusher, estimate about 1,600 t/d and 196,000 t/a.
Product type	Gold dore.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Probable and inferred	1,500,000 tons	0.129 tr oz/ton Au	1983	309
2..Not reported in reference	1,200,000 tons	0.13 tr oz/ton Au; 0.30 tr oz/ton Ag	1982	444

REFERENCES

7, 90, 228, 309, 356, 444, 598.

USGS quad maps	Walker Lake, 1:250,000. Aurora, 15'.
USBM sequence number	0320210544.
Mid number	2601790.

Comments: Ore body reflected in published reserves is reported to be open at depth and along strike.

B & B—MERCURY

Alternate names: Chrysler, Kollsman Mine

Commodities: Hg, Sb

LOCATION-OWNERSHIP

County	Esmeralda.
Mining district	Oneota (Fish Lake Valley).
Elevation	2,414 m.
Topography	Rugged.
Domain	National forest.

General location	About 91 km west of Tonopah and 27 km northwest of Dyer.
Meridian	Mount Diablo.
Tract	Sec. 1, T 1 S, R 33 E.
Latitude	37°53'17" N.
Longitude	118°15'04" W.

Owner	Robert W. Hughes (locator), Las Vegas, NV (1982).

GEOLOGY

Type of ore body	Disseminated; breccia fill.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting; lithology; bedding.
Mineralized zone average dimensions, m (estimated):	
Length	600.
Width	300.
Thickness	15.
Mineral names	Cinnabar, schuetteite, chalcedony, opal, zeolites, alunite, kermesite.

Host formation	Volcanics.
Geologic age	Tertiary.
Rock relationships	Opalite blanket, encloses ore, gangue. Rhyolite tuff, lies under ore. Andesite breccia, near ore.
Alteration	Extensive silicification of rhyolite tuffs.
Size	Small.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface; underground.
Mining method	Open pit; drift.
Year of discovery	1925.
Discovery method	Ore mineral in place.
Initial production	1927.
Last production	1970.
Past production	See comments.

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	<10 km.
Mill location	On-site.
Mill status	Dismantled.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

8, 29, 42, 103, 148, 276, 376.

USGS quad maps	Mariposa, 1:250,000. Benton, 15'.
USBM sequence number	0320090084.
USGS MRDS number	M055003.

Comments: Published past production data are obscure and some production credited to the B & B Mine between 1957 and 1970 was taken from other ore bodies nearby. Mercury production from the district is probably about 8,000 flasks. The remaining reserves are low grade and large tonnage.

B & C SPRINGS—MOLYBDENUM

Alternate names: B C Project, B C Well, U.V. Industries Moly Prospect

Commodities: Mo, Cu, Ag

LOCATION-OWNERSHIP

County	Nye.	**General location**	About 75 km northeast of Hawthorne.
Mining district	Paradise Peak.	**Meridian**	Mount Diablo.
Elevation	2,140 m.	**Tract**	Sec. 34, T 11 N, R 37 E.
Topography	Rolling.	**Latitude**	38°46'50" N.
Domain	Mixed.	**Longitude**	117°48'06" W.
Owner	Sharon Steel Corp., Miami Beach, FL (1982).		

GEOLOGY

Type of ore body	Disseminated; fissure vein.	**Host formation**	Luning.
Origin	Hydrothermal; contact metasomatic.	**Geologic age**	Upper Triassic.
Shape of ore body	Irregular; tabular.	**Rock relationships**	Limestone, is ore, encloses ore.
Ore controls	Lithology; igneous.	**Size**	Large.
Strike and dip of mineralized zone.	N 15° E: 05° E.		
Mineralized zone average dimensions, m:			
Length	1,195.		
Width	465.		
Thickness	51.		
Depth	172.		
Mineral names	Molybdenite, chalcopyrite, pyrite, tetrahedrite, sphalerite, covellite, magnetite, calcite, dolomite, quartz.		

DEVELOPMENT

Current status	Active-explored prospect.	**Distance to water supply**	On-site.
		Road requirement	<50 km.
Year of discovery	1968.	**Distance to power supply**	<50 km.
Discovery method	Geophysical anomaly.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	131,000,000 t	0.12% Mo	1983	710

REFERENCES

11, 29, 156, 196, 357, 368, 433, 626, 646, 710, 750, 758, 827, 828, 837.

USGS quad maps	Tonopah, 1:250,000. Paradise Peak, 7.5'.
USBM sequence number	0320230678.

BALD MOUNTAIN—GOLD

Alternate names: BF Claim Group, Top Group

Commodities: Au

LOCATION-OWNERSHIP

County	White Pine.
Mining district	Bald Mountain.
Elevation	2,440 m.
Topography	Mountainous.
Domain	BLM administered.

General location	About 130 km northwest of Ely.
Meridian	Mount Diablo.
Tract	Secs. 16, 17, 18, T 24 N, R 57 E (unsurveyed).
Latitude	39°57′55″ N.
Longitude	115°34′31″ W.

Owner-operator	Placer U.S., Inc., San Francisco, CA (subsidiary of Placer Development Ltd., Vancouver, BC, Canada), 75% ownership (1984).

GEOLOGY

Type of ore body	Disseminated.
Origin	Probably hydrothermal.
Shape of ore body	Unknown.
District ore controls	Faulting, lithology.
Strike and dip of district rocks.	Northwest: 10° to 20° E.

Mineralized zone development dimensions, m:

	Area 1	Area 3	Area 5	Top area
Length	600	600	600	760
Width	600	460	300	760

Mineral names	Unavailable

(Known district minerals include quartz, jasper, pyrite, calcite, stibnite, malachite, chrysocolla, cerussite, powellite, molybdenite.)

Host formation	Unknown.
Geologic age	Unknown.
Rock relationships	Limey shales, surface, at drill roads. Limestone, surface, at drill roads.
Size	Small.

NOTE: Past district gold production came from veinlike replacement deposits in breccia zones (some jasperoid) along northwest-, northeast-, or north-striking faults in limestone; northwest- or west-striking quartz veins in quartz monzonite porphyry, and valley placers.

DEVELOPMENT

Current status	Active-testing; exploration; development.
Type of operation	Surface.
Mining method	Conventional open pit.
Year of discovery	Exploration since 1975.
Discovery method	Geochemical; drilling.
Initial production	1983 (initial testing).
Last production	Ongoing.
Past production	For 2 months, 109 kg (3,500 tr oz) Au was produced from 60,000 t of ore during test heap leaching (1983) (*499*).

Distance to water supply	On-site; deep well.
Road requirement	Access—13 km improvement; 3 km new.
Distance to power supply	Unknown.
Mill location	On-site.
Mill status	Construction.
Milling method	Conventional cyanide heap leach—study ongoing whether carbon-adsorption or zinc precipitation for gold recovery.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Reserves indicated	1,600,000 t	3.43 g/t Au	1981	563
2..Not reported in reference[1]	200,000 tons	0.10 tr oz/ton Au	1983	495
3..Indicated and inferred	2,800,000 tons	0.09 tr oz/ton Au	1984	499

REFERENCES

58, 284, 495, 499, 563, 577, 587, 618, 785.

USGS quad maps	Ely, 1:250,000. Cold Creek Ranch, 15′.
USBM sequence number	0320330503.

Comments: In 1983, mining of 230,000 t of ore from Area 5 at the rate of 1,800 t/d began for test heap leaching. Tests were scheduled to begin in September 1983 and end in June 1984. Intensive ongoing exploration in 1983 was defining reserves in the 3 other adjacent areas. Reserves are contained in 6 deposits.

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[1] This resource was described as minable reserves for test work.

BASIC, INC.—MAGNESITE

Alternate names: Gabbs

Commodities: MgO

LOCATION-OWNERSHIP

County	Nye.
Mining district	Gabbs.
Elevation	1,646 m.
Topography	Rugged.
Domain	Private; BLM administered.
Owner	C-E Basic, Gabbs, NV (1984).

General location	About 74 km northeast of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 26, T 12 N, R 36 E.
Latitude	38°52'11" N.
Longitude	117°53'50" W.

GEOLOGY

Type of ore body	Replacement.
Origin	Metamorphism; hydrothermal.
Shape of ore body	Irregular; massive.
Ore controls	Lithology.
Mineralized zone average dimensions, m:	
Length	1,520.
Width	1,000.
Thickness	60.
Depth	0.
Mineral names	Magnesite, brucite.

Host formation	Luning.
Geologic age	Triassic.
Rock relationships	Limestone, lies under ore. Shale, lies under ore. Dolomite, replaced by ore, gangue.
Size	Large.

DEVELOPMENT

Current status	Active-producer.
Type of Operation	Surface.
Mining method	Open pit.
Year of discovery	1927.
Discovery method	Ore mineral in place.
Initial production	1941.
Last production	1984.
Past production	Confidential proprietary data.

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	Active.
Milling method	Crushing, heavy media, flotation, calcining.
Process rate	2,000 t/d.
Product type	Refractory magnesia.
Distance shipped	46 km.
Destination	Luning, NV, for transshipment.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Measured	27,000,000 tons	Magnesite containing <5% CaO	1956	749
2.. Do	18,000,000 tons	Magnesite containing 5% to 26% CaO	1956	749
3.. Do	7,000,000 tons	Magnesite containing >26% CaO	1956	749
4..Indicated	2,000,000 tons	Magnesite containing <5% CaO	1956	749
5.. Do	100,000 tons	Magnesite containing 5% to 26% CaO	1956	749

REFERENCES

212, 273, 357, 366, 609, 686, 699, 733, 749.

USGS quad maps	Tonopah, 1:250,000. Paradise Peak, 15'.
USBM sequence number	0320230156.
Mid number	2600864.

BATTLE MOUNTAIN COPPER BASIN—COPPER

Alternate names: Copper Basin Mine-Duval Corp.

Commodities: Cu, Ag, Au

LOCATION-OWNERSHIP

County	Lander.
Mining district	Battle Mountain.
Elevation	1,615 m.
Topography	Rugged.
Domain	Private.

General location	About 10 km southwest of Battle Mountain.
Meridian	Mount Diablo.
Tract	Sec. 32, T 32 N, R 44 E.
Latitude	40°36'12" N.
Longitude	117°02'50" W.

Owner-operator	Duval Corp., Tucson, AZ (subsidiary of Pennzoil Co., Houston, TX) (1984).

GEOLOGY

Type of ore body	Disseminated; stockwork.
Origin	Hydrothermal; oxidation.
Shape of ore body	Tabular.
Ore controls	Igneous; fracturing.
Mineralized zone average dimensions, m:	
Length	1,000.
Width	600.
Thickness	30.
Depth	75.
Mineral names	Malachite, chrysocolla, cuprite

Host formation	Igneous intrusive.
Geologic age	Upper Cretaceous.
Rock relationships	Quartz monzonite, ore in fractures, gangue. Conglomerate, gangue.
Size	Medium.

DEVELOPMENT

Current status	Active-standby.
Type of operation	Surface.
Mining method	Bench (berm).
Year of discovery	<1869.
Discovery method	Ore in place.
Initial production	1897.
Last production	Possibly 1981.

Distance to water supply	<10 km.
Road requirement	<50 km.
Distance to power supply	On-site.
Mill status	Active, standby.
Milling method	Solvent extraction; electrowinning
Process rate	5,170-t/a (18-t/d) output capacity.
Product type	Cathode quality copper.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Measured	948,000 tons	1.49% Cu; 0.027 tr oz/ton Au; 0.39 tr oz/ton Ag.	1978	707
2..Not reported in reference	3,066,000 tons (mill).	1.75% Cu (sulfide)	1968	606
	22,657,000 tons (leach).	0.41% Cu (oxide)	1968	606

REFERENCES

144, 220, 591, 606, 641, 648, 693, 705, 707, 708, 717, 742.

USGS quad maps	Winnemucca, 1:250,000 Antler Peak, 15'.
USBM sequence number	0320150003.
USGS MRDS number	M030001.
Mid number	2600220.

BATTLE MOUNTAIN COPPER CANYON—GOLD

Alternate names: Copper Canyon Mine
Ore body names: Northeast, Tomboy, Minnie, Fortitude

Commodities: Au, Ag (Cu formerly produced from adjacent pit)

LOCATION-OWNERSHIP

County	Lander.
Mining district	Battle Mountain
Elevation	1,700 m.
Topography	Rugged.
Domain	Private; public-BLM administered.

General location	About 20 km southwest of Battle Mountain.
Meridian	Mount Diablo.
Tract	Sec. 34, T 31 N, R 43 E.
Latitude	40°31'12" N.
Longitude	117°07'13" W.

Owner-operator	Duval Corp., Tucson, AZ (subsidiary of Pennzoil Co., Houston, TX) (1984).

GEOLOGY

Type of ore body	Stockwork (Fortitude ore body).
Origin	Contact metasomatic, replacement.
Shape of ore body	Tabular.
Ore controls	Faults; fractures.
Strike and dip of mineralized zone.	North: vertical.
Age of mineralization	Middle Tertiary (37 million yr).
Mineralized zone average dimensions, m (estimated):	
Length	520.
Width	340.
Thickness	120.
Depth	75.
Mineral names	Free gold, silver, pyrrhotite, pyrite, "soluble" copper.

Host formation	Battle.
Geologic age	Pennsylvanian.
Rock relationships	Unavailable.
Alteration	Silicification.
Size	Medium.

DEVELOPMENT

Current status	Active-producer, development.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1981 (announced—Fortitude).
Discovery method	Geologic inference, geochemical sampling; drilling.
Initial production	Dec. 1984 from Fortitude ore body.
Annual production rate	Reported 1983 mill expansion will enable company to produce 4.7 t Au and 46.7 t Ag during 1985, when production from the Fortitude ore body comes on-stream; currently about 36,000 t/d ore produced.

Distance to water supply	<3 km, wells in Reese Valley.
Road requirement	Existing.
Distance to power supply	Existing, 5 km.
Mill location	On-site.
Mill status	Active-producing, expansion.
Milling method	Gravity (20%)—tabled, amalgamated, retorted. Cyanide agitated tank leach (80%)—carbon-in-pulp, electrolysis, smelting.
Process rate	3,200 to 3,400 t/d (1982).
Product type	Dore bullion bars, 95% to 96% Au-Ag.
Destination	Engelhard Industries, Union City and Anaheim, CA.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
Minnie and Tomboy:				
1..Not reported in reference	3,900,000 tons	0.09 tr oz/ton Au; 0.28 tr oz/ton Ag	1981	164
Fortitude:				
1..Proven and probable	16,000,000 tons	0.15 tr oz/ton Au; 0.57 tr oz/ton Ag	1981	164
2..Not reported in reference	14,500,000	4.8 g/t Au; 18 g/t Ag	1983	435
3.. Do	15,000,000 tons	2,400,000 tr oz Au; 9,200,000 tr oz Ag	1984	400

REFERENCES

13, 33, 34, 35, 54, 55, 56, 57, 88, 89, 90, 141, 142, 143, 144, 149, 151, 164, 224, 317, 328, 378, 381, 391, 412, 434, 435, 437, 438, 465, 484, 500, 558, 588, 590, 591, 605, 606, 608, 641, 693, 706, 707, 709, 711, 712, 742, 817, 818, 820, 825, 838.

USGS quad maps	Winnemucca, 1:250,000. Antler Peak, 15'.
USBM sequence number	0320150631.
Mid number	260550.

Comments. Production began in 1967 as a copper property. Operations shifted about 1978 to adjacent gold-silver ore bodies when copper prices declined and precious metal prices climbed. The existing flotation mill was converted to precious metal recovery. Of 4 separate gold ore bodies, the Minnie and Tomboy were mined initially and are essentially depleted. The Fortitude ore body, described above, is the largest with development completed in 1984. The mill expansion to handle Fortitude ore will enable Duval to produce 4.7 t (150,000 tr oz) Au and 46.7 t (1.5 million tr oz) Ag during 1985 (*434*).

BEAR—COPPER

Alternate names: None	Commodities: Cu, Mo, Au, Ag

LOCATION-OWNERSHIP

County	Lyon.	General location	About 54 km southeast of Carson City.
Mining district	Mason Valley.	Meridian	Mount Diablo.
Elevation	1,329 m.	Tract	Sec. 4, T 13 N, R 25 E.
Domain	Private.	Latitude	39°00′47″ N.
		Longitude	119°11′24″ W.

Owner	The Anaconda Minerals Co., Denver, CO (subsidiary of Atlantic Richfield Co., Denver, CO) (1984).

GEOLOGY

Type of ore body	Replacement; disseminated.	Host formation	Porphyry dikes.
Origin	Hydrothermal; oxidation.	Geologic age	Tertiary.
Shape of ore body	Unknown.	Rock relationships	Quartz monzonite, encloses ore, gangue. Granodiorite, near ore.
Ore controls	Igneous; contact zone; faulting.		
Mineral names	Chalcopyrite, pyrite, bornite, molybdenite.	Size	Large.

DEVELOPMENT

Current status	Inactive-explored prospect.	Distance to water supply	<10 km.
Type of operation	Prospect.	Road requirement	<10 km.
		Distance to power supply	<10 km.
Year of discovery	1961.		
Discovery method	Auxiliary mineral in place.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. Not reported in reference	500,000,000 tons	0.40% Cu	1979	829

REFERENCES

453, 695, 822, 829.	USGS quad maps	Reno, 1:250,000. Wabuska, 15′.
	USBM sequence number	0320190171.

Comments: The deposit does not outcrop and is deeply buried.

BELL MOUNTAIN—GOLD

Alternate names: None

Commodities: Au, Ag

LOCATION-OWNERSHIP

County	Churchill.
Mining district	Fairview.
Elevation	1,810 m.
Topography	Hilly.
Domain	Private.
General location	About 60 km southeast of Fallon.
Meridian	Mount Diablo.
Tract	Sec. 10, T 15 N, R 34 E.
Latitude	39°10'45" N.
Longitude	118°07'59" W.
Owner	Nevada Silver, Inc. (subsidiary of American Pyramid Resources, Inc., Vancouver, BC, Canada), 100% (1982).
Owner-operator	Southern Pacific Land Co. (if option agreement met in 1984, will own 66.6% of the property and will become the operator) (1984).

GEOLOGY

Type of ore body	Vein; brecciated, sheared.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Fracturing; faulting.
Strike and dip of mineralized zone.	N 90° W: 45° S (Main Vein).
Mineralized zone average dimensions, m:	
Length	>1,600 (reserves developed on 300 m).
Width	>115 (downdip).
Thickness	10 to 18.
Mineral names	Possible electrum and argentite, native silver, cerargyrite, possible acanthite, yellow-gray chlorides, manganiferous calcite, ocherous limonite, quartz, adularia, barite, fluorspar, rhodochrosite, montmorillonite.
Host formation	Undifferentiated volcanics.
Geologic age	Tertiary (Miocene).
Rock relationships	Rhyolite pyroclastics, encloses ore (vein). Tuff, air fall, encloses ore (vein). Basalt dikes, near ore. Calcite-quartz vein, contains ore.
Alteration	Broad silicification, chloritization, and argillization with seritization close to walls of vein; oxidation.
Size	Small.

DEVELOPMENT

Current status	Active-development; exploration.
Type of operation	Surface.
Mining method	Open-pit; on 5-m benches.
Year of discovery	Unavailable.
Discovery method	Unvailable.
Initial production	1927.
Past production	35 t ore; 17 g/t (0.5 tr oz/ton) Au; 562 g/t (16.4 tr oz/ton) Ag.
Annual production rate	Anticipate 1.43 t Au; 37.5 t Ag (recovery from proven reserves).
Distance to water supply	12 km pipeline from well at Stingaree Flat.
Road requirement	12 km to U.S. Highway 50.
Distance to power supply	On-site caterpillar diesels.
Mill location	On-site.
Mill status	Development.
Milling method	Tank cyanidation (CCD); zinc precipitation, smelting.
Process rate	650 t/d (1982 preliminary).
Product type	Dore bullion (Ag-Au 30:1).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Proven	1,000,000 t	1.5 g/t Au; 50 g/t Ag (Main Vein)	1982	40
2..Not reported in reference	1,500,000 to 2,000,000 t.	4.2 g/t Au; 100 g/t Ag (Zphinz Zone); grade based on assay of first crosscut.	1982	71
3..Proven	1,000,000 tons	0.055 tr oz/ton Au; 1.4 tr oz/ton Ag	1984	208
Probable	1,000,000 tons	0.022 tr oz/ton Au; 1.0 tr oz/ton Ag	1984	208
Possible	500,000 tons	0.14 tr oz/ton Au; 3.3 tr oz/ton Ag (Zphinz Zone)	1984	208

REFERENCES

40, 71, 84, 208, 224, 802.

USGS quad maps	Reno, 1:250,000. Bell Canyon, 7.5'.
USBM sequence number	0320010050.
Mid number	2601775.

Comments: Sulfides and sulfosalts have been completely leached from the vein. Original ore minerals were electrum and argentite. Zphinz Zone was discovered as a cross structure of Main Vein in about 1982. Large reserves of low-grade 'ore' reported as extensions of Main Vein. Recent discovery of ore in the Zphinz Zone could alter original development plans.

BIG LEDGE—BARITE

Alternate names: None

Commodities: BaSO$_4$

LOCATION-OWNERSHIP

County	Elko.
Mining district	Snake Mountains.
Elevation	2,440 m.
Topography	Rugged.
Domain	Mixed; private leases and unpatented claims on public lands administered by BLM.
Owner	Mary's River Ranch (1983).
Operator	Chromalloy American Corp., St. Louis, MO (1983).

General location	About 53 km northwest of Wells.
Meridian	Mount Diablo.
Tract	Sec. 27, T 42 N, R 61 E.
Latitude	41°29'57" N.
Longitude	115°03'02" W.

GEOLOGY

Type of ore body	Sedimentary.
Origin	Sedimentation; hydrothermal.
Shape of ore body	Tabular; irregular.
Ore controls	Bedding; lithology.
Strike and dip of mineralized zone.	N 15° to 45° E: 30° to 45° NW.
Mineralized zone average dimensions, m:	
Length	380.
Width	105.
Thickness	30.
Depth	0.
Mineral names	Barite.

Host formation	Valmy.
Geologic age	Ordovician,
Rock relationships	Chert, lies along ore, encloses ore. Shale, lies along ore, encloses ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-explored.
Type of operation	Possible surface.
Year of discovery	1978.
Discovery method	Ore mineral in place.
Initial production	No production.

Distance to water supply	Unknown.
Road requirement	<50 km.
Distance to power supply	<50 km.
Mill location	No mill.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

77, 95, 123, 205, 226, 278, 546, 669, 716, 775, 778.

USGS quad maps	Wells, 1:250,000. Black Butte NE, 7.5'.
USBM sequence number	0320070904.

BISONI—FLUORINE

Alternate names: Bisoni Fluorite, Fish Creek	Commodities: CaF_2, Zn, Be

LOCATION-OWNERSHIP

County	Eureka.	General location	About 15 km southwest of Eureka.
Mining district	Fish Creek.	Meridian	Mount Diablo.
Elevation	2,316 m.	Tract	Sec. 23, T 18 N, R 52 E.
Topography	Hilly.	Latitude	39°25'12" N.
Domain	BLM administered.	Longitude	116°05'17" W.
Owner	Maynard and Lester Bisoni (1964).		

GEOLOGY

Type of ore body	Disseminated; replacement; fissure vein.	Host formation	Antelope Valley Limestone.
Origin	Hydrothermal.	Geologic age	Middle Ordovician.
Shape of ore body	Tabular; massive.	Rock relationships	Limestone, ore in fractures. Limestone, encloses ore.
Ore controls	Lithology; bedding.		
Strike and dip of mineralized zone.	N 45° W: 5° S.	Size	Large.
Mineralized zone average dimensions, m:			
Length	1,200.		
Width	790.		
Thickness	98.		
Depth	34.		
Mineral names	Fluorite, quartz, calcite, limonite, sphalerite, beryl, hematite, muscovite, scheelite, molybdenite, sericite.		

DEVELOPMENT

Current status	Inactive-explored prospect.	Distance to water supply	<10 km.
		Road requirement	<50 km.
Year of discovery	1960.	Distance to power supply	<50 km.
Discovery method	Ore mineral in place.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

275, 281, 545, 593.		USGS quad maps	Millet, 1:250,000. Bellevue Peak, 15'.
		USBM sequence number	0320110195.

BLOODY CANYON—ANTIMONY

Alternate names: Red Star, Hutton

Commodities: Sb, Ag

LOCATION-OWNERSHIP

County	Pershing.	General location	About 15 km south of Imlay.
Mining district	Star.	Meridian	Mount Diablo.
Elevation	1,975 m.	Tract	Sec. 35, T 31 N, R 34 E.
Topography	Rugged.	Latitude	40°31'02" N.
Domain	Mixed.	Longitude	115°06'06" W.

Owner	Hybert L. Neal (1960).
Operator	Metro-dyne International, Inc., Oreana, NV (1970).

GEOLOGY

Type of ore body	Fissure vein.	Host formation	Koipato.
Origin	Hydrothermal.	Geologic age	Triassic.
Shape of ore body	Tabular.	Rock relationships	Rhyolite, encloses ore. Limestone, near ore.
Ore controls	Faulting; fracturing.	Size	Small.
Strike and dip of mineralized zone:			
West Vein	N 10° W: 80° to 85° E.		
East Vein	N 10° to 25° E: 80° to 85° E.		
Mineralized vein average dimensions, m:			
Length	100.		
Width	60.		
Thickness	1.		
Depth	0.		
Mineral names	Stibnite, pyrite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	On-site.
Type of operation	Underground.	Road requirement	None.
		Distance to power supply	<50 km.

Year of discovery	1868.
Discovery method	Ore mineral in place.
Initial production	1907.
Last production	1942.
Past production	100 t metal (*376*).

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

74, 329, 376.

USGS quad maps	Lovelock, 1:250,000. Imlay, 15'.
USBM sequence number	0320270294.
USGS MRDS number	M060338.

Comments: The Bloody Canyon is reported to be second only to the Sutherland Mine in antimony production; principal periods of production were in 1907 and 1917–21.

BLUE STAR—GOLD

Alternate names: Number 8, South Pit, East Pit, North Pit

Commodities: Au, turquoise

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Lynn.
Elevation	1,830 m.
Topography	Hilly.
Domain	Private.
General location	About 43 km northwest of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 4, T 35 N, R 50 E.
Latitude	40°56'35" N.
Longitude	116°21'38" W.
Owner-operator	Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp., New York, NY) (1984).

GEOLOGY

Type of ore body	Disseminated.
Origin	Hydrothermal.
Shape of ore body	Irregular in plan.
Ore controls	Faulting; fracturing; lithology.
Strike and dip of mineralized zone.	Northwest: unknown.
Age of mineralization	Miocene (37.5 million yr).
Mineralized zone average dimensions, m:	
Length	365.
Width	200.
Thickness	90.
Mineral names	Quartz, clays, sericite, kaolinite, calcite, barite, pyrite, realgar, orpiment, stibnite, cinnabar, native gold, turquoise, chrysocolla, malachite, euchroite, montmorillonite, sphalerite.
Host formation	Vinini (in upper plate of Roberts Mountains Thrust Fault).
Geologic age	Ordovician.
Rock relationships	Sandy siltstone, ore in fractures, gangue, most favored host. Cherty shale, adjacent to ore. Quartzite sandstone, contains some ore. Limestone, dolomitic limestone, sandy calcareous siltstone, beneath ore. Dacite porphyry dikes, near ore. Quartz diorite plug, about 3 km north. Jasperoid, near ore.
Alteration	Silicification, sericitic kaolinitic
Size	Small.

DEVELOPMENT

Current status	Active-producer (intermittent).
Type of operation	Surface.
Mining method	Open pit; bench. Mining by Carlin Gold Mining Co. began in 1974 and consists of 3 pits.
Year of discovery	1959 (first claimed for turquoise in 1929).
Discovery method	Unknown.
Initial production	1975.
Last production	Ongoing 1983.
Past production	About 124 kg (4,000 tr oz) in 1980 (*132*).
Road requirement	8-km access road to Carlin Mine built in 1974.
Mill location	Mill grade trucked 8 km to Carlin mill.
Mill status	Active.
Milling method	Agitated cyanide leach, CCD; oxidation-chlorination pretreatment for carbonaceous ore; CCD wash; Merrill-Crowe zinc precipitation, smelting.
Product type	Dore bars, weighing about 34 kg.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference[1]	1,800,000 tons	0.12 tr oz/ton Au	1974	517

REFERENCES

59, 61, 90, 132, 182, 183, 319, 398, 458, 505, 517, 570, 593, 616.

USGS quad maps	Winnemucca, 1:250,000. Rodeo Creek NE, 7.5'.
USBM sequence number	0320110166.
Mid number	2600500.

Comments: This property was initially developed for its high-quality turquoise. In 1968, Newmont Mining Corp. acquired property and subsequent drilling defined 3 ore bodies (South, East, North) with reserves described above.

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[1] Resource referred to as reserves.

BOOTSTRAP—GOLD

Alternate names: Bootstrap Mine Dump

Commodities: Au

LOCATION-OWNERSHIP

County	Elko.
Mining district	Bootstrap.
Elevation	1,750 m.
Topography	Rolling hills.
Domain	Private.

General location	About 56 km northwest of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 10, T 36 N, R 49 E.
Latitude	41°01'08" N.
Longitude	116°24'58" W.

Owner-operator	Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp., New York, NY) (1984).

GEOLOGY

Type of ore body	Disseminiated.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting, fracturing, lithology.
Strike of mineralized zone.	N 70° E.
Mineralized zone average dimensions, m (estimated):	
Length	400.
Width	180.
Mineral names	Undetermined.

Host formation	Vinini (upper plate of Roberts Mountains Thrust Fault).
Geologic age	Ordovician.
Rock relationships	Brecciated limestone, contains ore in fractures. Siltstone, contains ore in fractures. Porphyry dikes, contains ore in fractures. Jasperoid, jasperoid breccia, near ore.
Alteration	Argillic, silicification.
Size	Small.

DEVELOPMENT

Current status	Active, producing.
Type of operation	Surface, low-grade dump leach.
Mining method	Open pit (inactive-ore body depleted). Mining began by Carlin Mining Co. in 1973.
Year of discovery	About 1940; Newmont made additional discoveries in early 1970's.
Discovery method	Surface sampling, drilling.
Initial production	Late 1950's or early 1960's; Carlin in 1975. Present dump leach began in 1979.
Last production	From open pit in 1978. Leach dump to produce until end of 1985 or 1986.
Past production	104.5 kg Au (1983) (*511*). About 820,000 t, 0.86 g/t Au ore has been treated into mid-1984.
Annual production rate	About 200 kg Au at peak, less currently.

Distance to water supply	On-site wells.
Road requirement	Existing, 19-km access road built to Carlin Mine.
Distance to power supply	On-site diesel electric generation.
Mill location	On-site.
Mill status	Active.
Milling method	Dump cyanide heap leach, carbon adsorption.
Process rate	200,000 t/a ore, at 54% Au recovery.
Product type	Gold-loaded carbon in drums.
Distance shipped	19 km.
Destination	Carlin mill at Carlin Mine for further processing by caustic-cyanide solution, strip solution, electrowinning on steel wool and smelted to dore products.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	2,100,000 tons	About 0.15 tr oz/ton Au (includes Carlin's Blue Star Mine 1974 unmined reserves).	1974	510
2..Proven	<1,000,000 tons	0.044 tr oz/ton Au (0.028 to 0.063 tr oz/ton; low-grade material stockpiled from previous mining operation).	1979	378

REFERENCES

83, 186, 226, 319, 378, 398, 412, 505, 506, 510, 511, 589, 616, 669.

USGS quad maps	McDermitt, 1:250,000. Santa Renia Field, 7.5'.
USBM sequence number	0320070349.
Mid number	2600501.

Comments: About 800,000 t of low-grade material containing 0.96 g/t was stockpiled for leaching from previous mining. Heap leaching of this material continues after construction of dump leach facility in 1978.

BOREALIS—GOLD

Alternate names: Jamies Ridge,[1] East Ridge Project

Commodities: Au, Ag, Hg (byproduct mercury)

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Aurora.
Elevation	2,195 m.
Topography	Hilly.
Domain	National forest.

General location	About 24 km southwest of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 17, T 6 N, R 29 E.
Latitude	38°22'57" N.
Longitude	118°45'36" W.

Owner	Houston International Minerals Corp. (HIMCO), Denver, CO (subsidiary of Tenneco, Inc) (1983).
Operator	W. E. Vining Co. (contractor), Carson City, NV (1983).

GEOLOGY

Type of ore body	Breccia fill; stratiform; disseminated.
Origin	Hydrothermal.
Shape of ore body	Lenticular (flattened football).
Ore controls	Faults; lithology; fractures; hot springs vents.
Strike and dip of mineralized zone.	N 55°E: relatively flat.
Age of mineralization	5 to 12 million yr, possibly Pliocene.
Mineralized zone average dimensions, m:	
Length	370.
Width	152.
Thickness	60.
Mineral names	Quartz, hematite, montmorillonite, chlorite, calcite, pyrite, barite, kaolinite, alunite.

Host formation	Esmeralda, Volcanics.
Geologic age	Miocene.
Rock relationships	Silicified andesite breccia, is ore. Sponge rock (altered tuff), is ore. Andesite flows and breccia, lies under ore. Andesite and ash flow tuff, lies along ore.
Alteration	Potassic, silicification, oxidation (ore zone), argillic, kaolin, propylitic (country rock).
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open-pit.
Year of discovery	1977 (HIMCO began exploration).
Discovery method	Geochemical anomaly.
Initial production	1981.
Last production	Ongoing.
Annual production rate	About 544,000 t ore planned, about 934 kg combined Au and Ag, about 870 kg (28,000 tr oz) Au.

Distance to water supply	5 km (wells to plan site tanks).
Road requirement	0.5 km new plant access.
Distance to power supply	11 km.
Mill location	On-site.
Mill status	Active.
Milling method	Agglomeration, cyanide heap leaching, Merrill-Crowe zinc precipitation.
Process rate	Crusher, 2,270 t/d.
Process type	34-kg dore buttons.
Destination	By air to Reno, NV, then shipped to Handy & Harmon, Attleboro, MA.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Identified	2,500,000 to 3,000,000 tons.	0.08 tr oz/ton Au; 0.62 tr oz/ton Ag	1981	383

REFERENCES

73, 196, 209, 228, 287, 356, 378, 380, 383, 485, 488, 512, 598, 651, 688, 696, 766.

USGS quad maps	Walker Lake, 1:250,000. Aurora 15'.
USBM sequence number	0320210463.
Mid number	2601655.

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[1] Jamies Ridge is another discrete ore body discovered in 1982, 6 km northeast of Borealis deposit. This 250-m by 100-m by 30-m-thick deposit was placed in production in April 1983 for about 7 months of mining to depletion. Production: first exploited in 1906 and again in the late 1950's; no records available.

BOULDER CITY-MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

County	Clark.
Mining district	Las Vegas.
Elevation	671 m.
Topography	Rolling.
Domain	Municipality.
Owner	City of Boulder City, NV (1980).

General location	About 39 km southeast of Las Vegas.
Meridian	Mount Diablo.
Tract	Sec. 23, T 23 S, R 64 E.
Latitude	35°56'45" N.
Longitude	114°47'23" W.

GEOLOGY

Type of ore body	Sedimentary.
Origin	Hydrothermal; sedimentation.
Shape of ore body	Tabular.
Ore controls	Bedding; lithology.
Strike and dip of mineralized zone.	East-west: 4° S.
Mineralized zone average dimensions, m:	
Length	1,158.
Width	716.
Thickness	18.
Depth	7.
Mineral names	Wad.

Host formation	Muddy Creek.
Geologic age	Miocene.
Rock relationships	Gypsiferous sandstone, encloses ore, lies over and under ore. Tuff, lies over and under ore. Gravel, lies over ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-explored.
Type of operation	Possible surface.
Year of discovery	1941.
Discovery method	Ore mineral in place.
Initial production	No production.

Distance to water supply	<10 km.
Road requirement	None.
Distance to power supply	<10 km.
Mill location	No mill.

PUBLISHED RESERVES-RESOURCES[1]

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. Indicated	1,000,000 tons	Average: 7.5% Mn; cutoff: 5% Mn	1949	407
2. Do	3,000,000 tons	Average: 4.5% Mn; cutoff: 3% Mn	1949	407
3. Do	6,000,000 tons	Average: 4.0% Mn; cutoff: 2% Mn	1949	407
4. Do	15,000,000 tons	Average: 3.0% Mn; cutoff: 1% Mn	1949	407

REFERENCES

36, 41, 267, 354, 386, 407, 547, 721, 733, 844.

USGS quad maps	Kingman, 1:250,000. Boulder City, 7.5'.
USBM sequence number	0320030322.

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[1] Tonnages are cumulative and rounded to nearest million.

BRAY-BEULAH—ANTIMONY

Alternate names: Beulah, Genesee, Aberasturi

Commodities: Sb, Ag

LOCATION-OWNERSHIP

County	Lander.	General location	About 22 km south of Austin.
Mining district	Big Creek.	Meridian	Mount Diablo.
Elevation	2,804 m.	Tract	Sec. 27, T 17 N, R 43 E.
Topography	Rugged.	Latitude	39°18′26″ N.
Domain	Private.	Longitude	117°07′52″ W.
Owner	Mary J. Bray (Beulah Claim), James O. Holmes (Genesee Claim) (1963).		

GEOLOGY

Type of ore body	Fissure vein.	Host formation	Valmy.
Origin	Hydrothermal.	Geologic age	Ordovician.
Shape of ore body	Tabular.	Rock relationship	Siliceous slate, encloses ore.
Ore controls	Faulting.	Size	Small.
Strike and dip of mineralized zone.	N 30° W: 45° to 85° SW.		
Mineralized zone average dimensions, m:			
Thickness	1.		
Mineral names	Stibnite, pyrite, graphite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	<10 km.
Type of operation	Underground.	Road requirement	<50 km.
		Distance to power supply	<50 km.
Year of discovery	1864.		
Discovery method	Ore mineral in place.		
Initial production	1891.		
Past production	>908 t Sb metal (*376*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

376, 693.

USGS quad maps	Millett, 1:250,000. Austin, 15′.
USBM sequence number	0320150192.

Comments: The Bray-Beulah is reported to be the third largest antimony producer in Nevada.

BUCKHORN—GOLD

Associated names: Barbi Lake Copper Mines, North Buckhorn, South Buckhorn, North Aspen, South Aspen

Commodities: Au, Ag (Au-Ag ratio = 1:15)

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Buckhorn.
Elevation	2,100 m.
Topography	Hilly.
Domain	Private.

General location	About 90 km southwest of Carlin.
Meridian	Mount Diablo.
Tract	Secs. 30, 31, T 27 N, R 49 E.
Latitude	40°10'53" N.
Longitude	116°29'33" W.

Owner	Cominco American, Inc., Spokane, WA (76%), and Pembina International Corp., Calgary, AB, Canada, combined will manage the operation. Pembina, as a minority partner, will put up a share of the development money for an identical profit sharing percentage (1984).

GEOLOGY

Type of ore body	Breccia (fault); vein.
Origin	Hydrothermal; oxidation.
Shape of ore body	Irregular; pods.
Ore controls	Faulting; igneous; lithology (breccia).
Age of mineralization	Pliocene (14.6 million yr).

Pit average dimensions, m (estimated):

	North Buckhorn	South Buckhorn
Length	400	360
Width	340	230

Mineral names	Native gold and silver, pyrite (argentiferous and auriferous), limonite, marcasite, adularia, kaolinite, montmorillonite.

Host formation	Undifferentiated basaltic andesite flows.
Geologic age	Pliocene
Rock relationships	Shale and siltstone, encloses ore. Basaltic andesitic flows, lies above ore. Gravels and conglomerates, lies beneath ore (Tertiary). Breccia, silicified, in places is ore.
Alteration	Argillic, kaolinization.
Size	Small.

DEVELOPMENT

Current status	Active-producing.
Type of operation	Surface.
Mining method	Open pit; about 1,191,000 t/a ore (1,034,000 t waste and subgrade) over 4 yr.
Year of discovery	1908.
Discovery method	Surface prospecting.
Initial production	Early 1984 (for Cominco).
Past production	Operations through 1950 yielded about 1,200 kg Au and 10,000 kg Ag; mining and milling beginning in 1979 yielded about 470 kg/a Au (*132*).
Annual production rate	Producing about 934 kg Au and 8,400 kg Ag.

Distance to water supply	On-site, <1 km.
Road requirement	None.
Distance to power supply	Unavailable.
Mill location	On-site.
Mill status	Development.
Milling method	Agglomeration, cyanide heap leach, Merrill-Crowe zinc precipitation, smelting.
Process rate	680,000 t/a; crusher, 259 t/h (285 ton/h).
Product type	Probably dore.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	5,000,000 tons	0.044 tr oz/ton Au; 0.583 tr oz/ton Ag	1983	769

REFERENCES

132, 135, 452, 593, 594, 675, 769, 779, 780, 781, 782, 784, 787, 833.

USGS quad maps	Winnemucca, 1:250,000. Horse Creek Valley, 15'.
USBM sequence number	0320110167.
USGS MRDS number	W016362.
Mid number	2600785.

Comments: Buckhorn Mine consists of at least 2 ore bodies. Current plans are to operate 2 separate open pits, the North Buckhorn and the South Buckhorn. Ore occurs within 60 m of surface. Ore is within oxide and sulfide zones. Company projected mine life from 1984 is 4 yr; mill, 7 yr.

BUCKINGHAM—MOLYBDENUM

Alternate names: AMAX Molybdenum Deposit, Rocky Mountain Energy Moly Deposit

Commodities: Mo, Ag, Cu, W

LOCATION-OWNERSHIP

County	Lander.
Mining district	Battle Mountain.
Elevation	1,798 m.
Topography	Rugged.
Domain	Mixed; private and BLM administered
General location	About 11 km southwest of Battle Mountain.
Meridian	Mount Diablo.
Tract	Sec. 30, T 32 N, R 44 E.
Latitude	40°36'56" N.
Longitude	117°03'42" W
Owner	AMAX, Inc., Denver, CO (33%); Rocky Mountain Energy Co., Broomfield, CO (Union Pacific Corp.) (1984).
Operator	AMAX, Inc. (1984).

GEOLOGY

Type of ore body	Stockwork; disseminated.
Origin	Hydrothermal; contact metasomatic.
Shape of ore body	Massive; irregular.
Ore controls	Igneous; fracturing.
Mineralised zone average dimensions, m:	
Length	2,000.
Width	1,200.
Thickness	640.
Mineral names	Pyrite, molybdenite, pyrrhotite, chalcopyrite, sphalerite, galena, arsenopyrite, bismuthinite, freibergite, tetrahedrite, quartz, scheelite.
Host formation	Widely varying lithologies.
Geologic age	Cambrian; Tertiary.
Size	Large.

DEVELOPMENT

Current status	Active-explored prospect.
Type of operation	Prospect.
Year of discovery	Undetermined.
Discovery method	Ore mineral in place.
Distance to water supply	Undetermined.
Road requirement	Undetermined.
Distance to power supply	Undetermined.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	907,000,000 tons	0.06% Mo	1982	701

REFERENCES

56, 381, 588, 590, 591, 592, 605, 606, 610, 693, 701, 706, 712, 717, 742, 794, 803, 813, 837.

USGS quad maps	Winnemucca, 1:250,000. Antler Peak, 15'.
USBM sequence number	0320150108.

Comments: Ore largely in fractures in hornfels and quartzites of the Harmony Formation (Cambrian).

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BUENA VISTA—IRON

Alternate names: None

Commodities: Fe

LOCATION-OWNERSHIP

County	Churchill.
Mining district	Mineral Basin.
Elevation	1,341 m.
Topography	Hilly.
Domain	Private.

General location	About 36 km southwest of Lovelock.
Meridian	Mount Diablo.
Tract	Sec. 4, T 24 N, R 34 E.
Latitude	39°58'25" N.
Longitude	118°09'55" W.

Owner-operator .... Southern Pacific Co., San Francisco, CA; U.S. Steel Corp., Salt Lake City, UT (1975).

GEOLOGY

Type of ore body	Replacement, breccia fill, disseminated.
Origin	Contact metasomatic.
Shape of ore body	Tabular, irregular, pipelike.
Ore controls	Igneous, faulting.
Mineralized zone average dimensions, m:	
Length	3,353.
Width	914.
Thickness	137.
Mineral names	Magnetite, hematite, scapolite, chlorite, calcite, quartz, apatite, sphene, hornblende.

Host formation	Leach.
Geologic age	Pennsylvanian.
Rock relationships	Lamprophyre, lies along ore, near ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Discovery method	Ore mineral in place.
Initial production	1952.
Last production	1960.

Distance to water supply	<10 km.
Road requirement	None.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..**Measured**[1]	18,000,000 long tons.	32.7% Fe	1971	454
2..**Indicated**[1]	3,000,000 long tons.	33.3% Fe	1971	454
3..**Measured**[2]	5,000,000 long tons.	26.2% Fe	1971	454
4..**Indicated**[2]	900,000 long tons.	22.1% Fe	1971	454
5..**Inferred**[2]	5,700,000 long tons.	22.1% Fe	1971	454
6..**Measured**[3]	5,500,000 long tons.	25.5% Fe	1971	454
7..**Indicated**[3]	2,400,000 long tons.	25.5% Fe	1971	454
8..**Inferred**[3]	4,700,000 long tons.	25.5% Fe	1971	454

REFERENCES

10, 76, 150, 282, 324, 332, 367, 454, 515, 536, 568, 579, 583, 733, 751, 802, 841.

USGS quad maps	Reno, 1:250,000. Dixie Hot Springs, 15'.
USBM sequence number	0320010043.

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[1] West ore body.
[2] South Central ore body.
[3] East ore body.

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BUILLION MONARCH—GOLD

Alternate names: Polar Resources Pit

Commodities: Au, Ag

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Lynn.
Elevation	1,770 m.
Topography	Hilly.
Domain	BLM administered.

General location	About 30 km northwest of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 10, T 35 N, R 50 E.
Latitude	40°55'03" N.
Longitude	116°20'37" W.

Owner-operator	Universal Gas (Montana), Inc., Elko, NV (1984).

GEOLOGY

Type of ore body	Vein (fault zone); disseminated.
Origin	Hydrothermal.
Shape of ore body	Podlike (along fault zone).
Ore controls	Faulting; fracturing.
Strike and dip of mineralized zone.	N 50° W: steeply northeast.
Age of mineralization	Miocene.
Mineralized zone average dimensions, m:	
Length	270.
Width	Unknown.
Pit depth	6 (estimated 1982).
Mineral names	Quartz, iron oxides, clays.

Host rocks	Roberts Mountains and Volcanics.
Geologic age	Devonian (Roberts Mountains), Tertiary (Volcanics).
Rock relationships	Fault gouge, contains ore, is ore. Limestone, lies under ore (footwall). Volcanics, lies above ore (hanging wall). Jasperoid, near ore.
Alteration	Silicification (gold zone), argillic (carbonate wall rock).
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Conventional open pit.
Past production	More than 90,000 t ore produced by 1981 (*728*).

Distance to water supply	On-site, developed.
Road requirement	Developed to site.
Mill location	On-site.
Mill status	Active.
Milling method	Carbon-in-pulp cyanide.
Process rate	180 t/d (peak load 360 t/d).

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information; however, published grade is 0.2 tr oz/ton Au (see comments) (*690*).

REFERENCES

182, 183, 533, 690, 728.

USGS quad maps	Winnemucca, 1:250,000. Rodeo Creek NE, 7.5'.
USBM sequence number	0320110214.
Mid number	2601343.

Comments: Average grade ranges from 7.5 to 56.6 g/t Au; highest grade reaching 240 to 270 g/t Au.

C-M ALUNITE—ALUMINUM

Alternate names: Clover Mountains

Commodities: Al, K_2SO_4, S

LOCATION-OWNERSHIP

County	Lincoln.	General location	About 43 km southeast of Caliente.
Mining district	Unorganized.	Meridian	Mount Diablo.
Elevation	1,610 m.	Tract	Sec. 10, T 7 S, R 70 E (unsurveyed).
Topography	Rolling.	Latitude	37°21'19" N.
Domain	BLM administered.	Longitude	114°10'05" W.
Owner	Earth Sciences, Inc., Golden, CO (1984).		

GEOLOGY

Type of ore body	Replacement.	Host formation	Volcanics.
Origin	Hydrothermal.	Geologic age	Tertiary.
Shape of ore body	Undetermined.	Rock relationships	Agglomerate, replaced by ore. Tuff, replaced by ore.
Ore controls	Igneous, lithology.	Size	Medium.
Mineralized zone average dimensions, m:			
Length	3,000.		
Width	3,000.		
Thickness	16.		
Depth	6.		
Mineral names	Alunite.		

DEVELOPMENT

Current status	Inactive-raw prospect.	Distance to water supply	<10 km.
Type of operation	Possible surface.	Road requirement	<10 km.
Year of discovery	1971.	Distance to power supply	<50 km.
Discovery method	Ore mineral in place.	Mill location	No mill.
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

259, 549, 724, 753.

USGS quad maps	Caliente, 1:250,000. Jack Mountain, 7.5'.
USBM sequence number	0320170001.

CALICO HILLS—IRON

Alternate names: Calico Deposit

Commodities: Fe, Cu

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Unincorporated.
Elevation	1,390 m.
Topography	Gentle.
Domain	Indian reservation.
Owner	Undetermined.

General location	About 51 km south of Fallon.
Meridian	Mount Diablo.
Tract	Sec. 5, T 13 N, R 29 E.
Latitude	39°01'03" N.
Longitude	118°45'54" W.

GEOLOGY

Type of ore body	Replacement, fissure vein.
Origin	Contact metasomatism.
Shape of ore body	Unknown (possibly lenticular).
Ore controls	Contact zone, lithology, faulting.
Mineralized zone average dimensions, m.	Unknown.
Mineral names	Magnetite, pyrite, pyrrhotite, chalcopyrite, grossularite, actinolite, epidote, galena, sphalerite, molybdenite, tremolite.

Host formation	Possibly Luning.
Geologic age	Upper Triassic.
Rock names	Sandstone. Shale. Limestone. Skarn (tactite).
Size	Large.

DEVELOPMENT

Current status	Unknown.
Type of operation	Prospect.
Year of discovery	1963.
Discovery method	Geophysical anomaly.
Initial production	None.

Distance to water supply	<50 km.
Road requirement	None.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information. Moore reports (*454*) that the Calico Hills deposit contains a very large quantity of material averaging 20% Fe and 0.07% Cu, and that high-grade portions have an average grade of 44% Fe.

REFERENCES

454, 598, 740.

USGS quad maps	Reno, 1:250,000. Weber Reservoir, 15'.
USBM sequence number	0320210388.

CANDELARIA—SILVER

Alternate names: Candelaria Partners Mine and Plant
Pit names: Lucky Hill, Mt. Diablo, Northern Belle

Commodities: Ag, Au

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Candelaria.
Elevation	1,731 m.
Topography	Hilly.
Domain	Mixed; private and BLM administered.
General location	About 80 km south of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 3, T 3 N, R 35 E.
Latitude	38°09'32" N.
Longitude	118°05'11" W.

Owner-operator	NERCO Metals, Inc., Fairbanks, AK (subsidiary of Pacific Power & Light Co., Portland, OR) (1984).
Owner	CoCa Mines, Inc., Denver, CO (owns 37% limited partnerships) (1984).

GEOLOGY

Type of ore body	Disseminated, veins parallel to bedding.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Fracturing.
Strike and dip of mineralized zone.	N 45° E: 40° to 60° N.
Age of mineralization	Early Cretaceous.
Mineralized zone average dimensions, m:	
Length	1,230.
Width	40.
Thickness	130.
Open pit depth	90 to 120.
Mineral names	Limonite, jarosite, gold, jamesonite, pyrite, chalcopyrite (minor), galena (minor), clays, dolomite.
Host formation	Candelaria.
Geologic age	Triassic.
Rock relationships	Shale (tuffaceous), serpentinite, contains ore.
Alteration	Silicification, dolomization.
Size	Medium.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface, heap leach.
Mining method	Open pit (2,400,000-t/a ore capacity; 32,600-t/d ore plus waste of which 9,300 t is recovered ore).
Year of discovery	1863.
Discovery method	Surface outcrop.
Initial production	August 1980 by Occidental; August 1983 by NERCO.
Last production	June 1982 by Occidental; ongoing production by NERCO.
Past production	8,389 kg Ag (1980) (*165*). 52,100 kg Ag, >286 kg Au (1981) (*165, 764*).
Annual production rate	About 53,000 kg Ag (1.7 million tr oz) and 280 kg Au (9,000 tr oz) produced between April and September.
Distance to water supply	8 km to two 300-m wells.
Road requirement	About 10 km, county road improved.
Distance to power supply	14 km, 69-kV power.
Mill location	On-site.
Mill status	Active.
Milling method	Agglomeration, cyanide heap leach, Merrill-Crowe zinc dust precipitation.
Mill feed capacity	7,300-t/d heap leach facility.
Product type	Dore bullion (34-kg buttons).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Proven	12 to 13,000,000 tons	3.15 tr oz/ton Ag and 0.002 tr oz/ton Au	1980	158
2..Not reported in reference	18,500,000 tons	1.09 tr oz/ton Ag (with gold byproduct)	1982	423

REFERENCES

48, 82, 83, 90, 92, 133, 158, 165, 197, 208, 300, 305, 378, 412, 423, 427, 436, 440, 491, 498, 540, 598, 599, 649, 655, 688, 691, 763, 764, 776, 777.

USGS quad maps	Walker Lake, 1:250,000. Candelaria, 7.5'.
USBM sequence number	0320210476.
Mid number	2601511.

Comments: The Candelaria Mine is the largest open pit silver mine in the United States. NERCO plans 5,000-ton/d mine rate (1.6 million tr oz) Ag production. A deeper ore body of massive sulfide nature has been tentatively recognized.

CARLIN—GOLD

Ore body names: Carlin-West, Main, East

Commodities: Au, Ag, Hg
(byproduct mercury)

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Lynn.
Elevation	1,877 m.
Topography	Hilly.
Domain	Mixed; private and BLM administered.

General location	About 32 km north of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 14, T 35 N, R 50 E.
Latitude	40°54'41" N.
Longitude	116°19'13" W.

Owner-operator	Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp., New York, NY) (1984).

GEOLOGY

Type of ore body	Disseminated, replacement stratiform.
Origin	Hydrothermal, oxidation.
Shape of ore body	Tabular, irregular.
Ore controls	Fractures (near attitude of host rocks), breccia zones, faults, lithology.
Strike and dip of mineralized zone.	Northeast: 60° W.
Age of mineralization	Mid-Tertiary.
Mineralized zone average dimensions (estimated exposure at mine), m:	
Length	2,000.
Width	800.
Thickness	100.
Mineral names	Gold, pyrite, barite, iron oxides, arsenopyrite, realgar, stibnite, cinnabar, galena, calcite, kaolinite, quartz, sericite, ellisite, weissbergite, avicennite, lorandite.

Host formation	Upper Roberts Mountains [illegible]
Geologic age	Upper Silurian and Lowe [illegible]
Rock relationships	Dolomitic siltstone, replac [illegible] ore in fractures, gangue. Silty dolomite, replaced by ore, ore in fractures, gangue. Silty to sandy carbonaceous dolomitic limestone, in vicinity of ore (unmineralized, unaltered host formation). Feldspar porphyry dikes, in mine area, sometimes contains gold.
Alteration	Argillization, silicification, pyritization, decarbonatization.
Size	Medium.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit—6-m benches, 26,000 t/d ore and waste mined.
Year of discovery	1962.
Discovery method	Geological inference, surface mapping, geochemical sampling, drilling.
Initial production	1965.
Last production	Ongoing 1983.
Past production (includes production from Carlin, Bootstrap, Blue Star, and Maggie Creek pits).	94,700 kg (3,044,000 tr oz) Au (1965–79) (*61*). 17,311 kg (556,559 tr oz) Au; includes 2,442 kg (78,523 tr oz) Au from heap leach (1980–83) (*511*).
Annual production rate	3,700 kg Au (Carlin mill only) (*511*).

Distance to water supply	4 km by pipeline from wells.
Road requirement	32 km paved access road built.
Distance to power supply	75 km from Battle Mountain area.
Mill location	On-site.
Mill status	Active.
Milling method	Agitated cyanide leach, CCD; oxidation-chlorination pretreatment circuit for carbonaceous ores; Merrill-Crowe zinc precipitation.
Process rate	2,000 t/d oxide ore, 450 t/d carbonaceous ore (Newmont's 1983 annual report—mill capacity of 2,495 t/d).
Product type	Dore buttons (about 34-kg), about 95% Au; byproduct mercury.
Destination	Various refiners (Englehard, Handy & Harmon, et al).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	11,000,000 tons	0.32 tr oz/ton Au (original reserves, Carlin pit only, stripping ratio = 3:1).	1964	319, 398
2.. Do[1]	4,700,000 tons	0.164 tr oz/ton Au	1982	2
3..Proven and probable	4,497,000 tons	0.160 tr oz/ton Au (includes Blue Star)	1983	511

REFERENCES

2, 6, 27, 59, 61, 83, 90, 114, 115, 132, 182, 183, 230, 233, 234, 240, 245, 247, 248, 297, 319, 378, 398, 409, 410, 411, 435, 505, 511, 516, 562, 569, 571, 572, 573, 589, 593, 616, 692, 773.

USGS quad maps	Winnemucca, 1:250,000. Rodeo Creek NE, 7.5'.
USBM sequence number	0320110027.
Mid number	2600062.

Comments: Silver and mercury production is minor. Some published sources state most favorable host lithology as silty dolomitic limestone.

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[1] Resource is referred to as reserves.

CARSON RIVER—MERCURY

Alternate names: None

Commodities: Hg, possible Au, Ag

LOCATION-OWNERSHIP

County	Carson City.	General location	About 13 km east of Carson City.
Mining district	Delaware.	Meridian	Mount Diablo.
Elevation	1,375 m.	Tract	Sec. 7, T 15 N, R 21 E.
Topography	River bed; in hilly to rugged terrain.	Latitude	39°10′52″ N.
Domain	BLM administered.	Longitude	119°39′56″ W.
Claimants	Rocky Comers, Craig Maxwell, Korey Farnworth, Carson City, NV (1982).		

GEOLOGY

Type of ore body	Placer.	Host	Carson River bottom.
Origin	Mill tailing.	Geologic age	Quaternary.
Shape of ore body	Disseminated; stratiform.	Rock relationships	Stream gravel, contains mercury. Various bedrock, contains mercury.
Ore controls	River channel.		
Age of deposit	Recent (1862—see Published Reserves-Resources section).	Size	Unknown, possibly medium.
Mineralized zone average dimensions (estimated), m:			
Length	<900.		
Width	<15.		
Thickness	Thin.		
Mineral names	Mercury.		

DEVELOPMENT

Current status	Inactive-limited exploration.	Distance to water supply	On-site.
Type of operation	Surface.	Road requirement	On-site.
Mining method	Placer.	Distance to power supply	3 km.
		Mill location	No mill.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.[1]

REFERENCES

3, 29, 96, 189, 453, 509, 585, 586, 736.

USGS quad maps	Reno, 1:250,000. New Empire, 7.5′.
USBM sequence number	0325100062.

Comments: Mercury is present in deep holes, bedrock, and gravel beds.

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[1] It has been reported that perhaps up to 14 to 15 million lb of mercury found its way into the river when mercury was used to recover precious metals from the Comstock (1982) (*3*).

CASELTON—LEAD-ZINC

Alternate names: Combined Metals Reduction, Raymond and Ely

Commodities: Zn, Pb, Ag, Au, Mn

LOCATION-OWNERSHIP

County	Lincoln.
Mining district	Pioche.
Elevation	1,890 m.
Topography	Hilly.
Domain	Mixed.
Owner	Kerr-McGee Corp., Oklahoma City, OK (1983).

General location	About 1 km south of Pioche.
Meridian	Mount Diablo.
Tract	Sec. 29, T 1 N, R 67 E.
Latitude	37°55'06" N.
Longitude	114°29'01" W.

GEOLOGY

Type of ore body	Replacement, fissure vein.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Bedding, faulting.
Mineralized zone average dimensions, m:	
Length	2,440.
Width	400.
Thickness	10.
Depth	300.
Mineral names	Sphalerite, galena, manganosiderite.

Host formation	Lyndon.
Geologic age	Middle Cambrian.
Rock relationships	Limestone, replaced by ore, encloses ore.
Host formation	Combined Metal Member of Pioche Shale.
Geologic age	Lower Cambrian.
Rock relationships	Limestone, replaced by ore, encloses ore. Shale, lies over ore, lies under ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Underground.
Mining method	Room and pillar.
Year of discovery	1864.
Discovery method	Ore mineral in place.
Initial production	1864.
Last production	1958.
Past production	2.95 million t sulfide ore averaging 171.4 g/t Ag, 4.5% Pb, and 12% Zn (*724*).

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site.[1]
Mill status	Inactive, standby.
Milling method	Flotation.
Process rate	1,400 t/d.
Product type	Zinc concentrate, lead concentrate.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.[2]

REFERENCES

216, 274, 322, 720, 721, 724, 791.

USGS quad maps	Caliente, 1:250,000. Pioche, 7.5'.
USBM sequence number	0320170099.
USGS MRDS number	M032004.

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[1] Caselton mill is owned by Combined Metals Reduction Corp.

[2] Sulfide ore has been largely exhausted; large quantities of oxidized ore remain.

CROWELL—FLUORINE

Alternate names: Daisy Mine, Fluorspar Mine, Beatty Fluorspar, Betsy Mine

Commodities: CaF_2

LOCATION-OWNERSHIP

County	Nye.
Mining district	Fluorine.
Elevation	1,356 m.
Topography	Hilly.
Domain	BLM administered.
Owner-operator	Crowell Fluorspar Co., Beatty, NV (1984).

General location	About 102 km southeast of Goldfield.
Meridian	Mount Diablo.
Tract	Sec. 23, T 12 S, R 47 E.
Latitude	36°52′52″ N.
Longitude	116°41′40″ W.

GEOLOGY

Type of ore body	Replacement, breccia fill, fissure vein.
Origin	Hydrothermal.
Shape of ore body	Irregular, pipelike, lenticular.
Ore controls	Faulting, lithology
Strike and dip of mineralized zone.	N 45° E: 88° E.
Mineralized zone average dimensions, m:	
Length	274.
Width	8.
Thickness	152.
Depth	25.
Mineral names	Fluorite, cinnabar, calcite, quartz, orthoclase, montmorillonite.

Host formation	Nopah.
Geologic age	Upper Cambrian.
Rock relationships	Dolomite, replaced by ore. Limestone, lies along ore, replaced by ore. Shale, lies along ore.
Size	Medium.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Underground.
Mining method	Open stope.
Year of discovery	1918.
Discovery method	Ore mineral in place.
Initial production	1919.
Past production	185,527 t (1919–76).

Distance to water supply	<10 km.
Road requirement	None.
Distance to power supply	On-site.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

4, 31, 97, 98, 99, 207, 213, 217, 266, 275, 281, 283, 368, 373, 381, 401, 545, 557, 714, 733, 811, 812, 815, 816.

USGS quad maps	Death Valley, 1:250,000. Bare Mountain, 15′.
USBM sequence number	0320230001.
USGS MRDS number	W006927.
Mid number	2600091.

DAYTON—IRON

Alternate names: Rosetta Mine

Commodities: Fe

LOCATION-OWNERSHIP

County	Lyon.
Mining district	Red Mountain.
Elevation	1,370 m.
Topography	Rolling.
Domain	Private.
Owner	Utah International, San Francisco, CA (1956).

General location	About 36 km southeast of Reno.
Meridian	Mount Diablo.
Tract	Sec. 6, T 17 N, R 23 E.
Latitude	39°21'56" N.
Longitude	119°26'57" W.

GEOLOGY

Type of ore body	Replacement.
Origin	Contact metasomatic, oxidation.
Shape of ore body	Massive.
Ore controls	Lithology, igneous.
Mineralized zone average dimensions, m:	
Length	400.
Width	150.
Thickness	150.
Depth	5.
Mineral names	Hematite, limonite, magnetite, pyrite.

Host formation	Metamorphosed sediments.
Geologic age	Triassic.
Rock relationships	Marble, replaced by ore. Skarn (tactite), replaced by ore. Hornfels, replaced by ore. Gneiss, encloses ore, gangue. Schist, encloses ore, gangue.
Size	Medium.

DEVELOPMENT

Current status	Inactive-explored prospect.
Type of operation	Prospect.
Mining method	Proposed open pit.
Year of discovery	1910.
Discovery method	Test shaft, bedrock sampling.
Initial production	Unknown.
Last production	None.
Past production	A small quantity mined during World War II for ship ballast (*454*).

Distance to water supply	<10 km.
Road requirement	None.
Distance to power supply	<10 km.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	45,000,000 long tons.	42% Fe	1971	454

REFERENCES

110, 113, 214, 453, 454, 536, 559, 560, 583, 600, 695.

USGS quad maps	Reno, 1:250,000. Churchill Butte, 15'.
USBM sequence number	0320190060.

DEE—GOLD

Alternate names: Boulder Creek deposit

Commodities: Au
Ag (not recovered)

LOCATION-OWNERSHIP

County	Elko.
Mining district	Bootstrap.
Elevation	1,645 m.
Topography	Hilly.
Domain	BLM administered.

General location	About 46 km northwest of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 34, T 37 N, R 49 E. Sec. 3, T 36 N, R 49 E.
Latitude	41°01′26″ N.
Longitude	116°25′18″ W.

Owner	Cordex V Syndicate (1984).
Operator	Dee Gold Mining Co. (Cordex V operational entity) (Dee Gold comprises Rayrock Mines, Inc., Lacana Mining Corp., Dome Exploration Ltd., all of Toronto, ON, Canada; each with 29.3%; J. S. Livermore, 12%. Rayrock will manage the operation for the partnership company).

GEOLOGY

Type of ore body	Disseminated.
Origin	Hydrothermal.
Shape of ore body	Elongate.
Ore controls	Faults (steep normal).
Strike and dip of mineralized zone.	East-west: unavailable.
Planned pit average dimensions (approximate), m:	
Length	800.
Width	800 (at widest point, narrow at each end).
Pit area	23 ha (57 acres).
Mineral names	Free gold (oxidized ore zone).

Host formation	Vinini (upper plate of Roberts Mountains Thrust Fault).
Rock relationships	Silicic shale and chert, is ore, gangue. Jasperoid, near ore, contains some Au.
Alteration	Silicification, pyritization, argillic.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Pit; about 800 t/d ore will be mined; stripping ratio = 7:1.
Year of discovery	Mid-1970's by Phillip Davis, local prospector.
Discovery method	Surface outcropping, geochemical, drilling.
Initial production	September-October 1984.
Annual production rate	About 1,200 kg (38,000 tr oz) Au anticipated for first 2 yr, then 1,000 kg/yr (33,000 tr oz) gold thereafter.

Distance to water supply	On-site wells.
Road requirement	About 3 km haul access.
Distance to power supply	About 9 km to Rossi area.
Mill location	On-site.
Mill status	Under construction.
Milling methods	Agitated cyanide leach, carbon-in-pulp, electrolysis. Heap leach.
Process rate	820 t/d.
Product type	Dore bullion.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	1,110,000 tons	0.028 tr oz/ton Au (leach grade)	1983	493
	2,670,000 tons	0.115 tr oz/ton Au (milling grade)	1983	493
2..Probable	2,670,000 tons	0.115 tr oz/ton Au	1984	659
	1,100,000 tons	Heap leach, low grade	1984	659

REFERENCES

14, 27, 28, 59, 61, 72, 90, 226, 278, 493, 529, 530, 555, 659, 669, 754.

USGS quad maps	McDermitt, 1:250,,000. Santa Renia Fields, 7.5′.
USBM sequence number	0320070126.

Comments: Property adjoins Carlin's Bootstrap Mine and was acquired by Cordex in 1981. Minimum mine life is 8 yr. During 1981 and 1982, about 240 exploratory drill holes were completed in proposed pit area. In late summer and early fall of 1982, 2 pilot-scale heap leach tests were conducted. Silver (high grade) reported tied to silica beneath gold zone. Company reported mine life is 8 yr from 1984.

DODGE-FORD—IRON

Alternate names: Ford Mine, Iron Horse, Iron Colt

Commodities: Fe

LOCATION-OWNERSHIP

County	Pershing.	General location	About 25 km southeast of Lovelock.
Mining district	Mineral Basin.	Meridian	Mount Diablo.
Elevation	1,262 m.	Tract	Sec. 6, T 25 N, R 34 E.
Topography	Gentle.	Latitude	40°04'10" N.
Domain	Mixed; private and BLM administered.	Longitude	118°12'00" W.
Owner	C. W. Hunley, et al (1971).		

GEOLOGY

Type of ore body	Replacement, breccia fill, disseminated.	Host formation	Metavolcanics.
Origin	Contact metasomatic, hydrothermal.	Geologic age	Upper Jurassic.
Shape of ore body	Lenticular, tabular.	Rock relationships	Andesite, gangue. Diorite, gangue.
Ore controls	Faulting, igneous.	Size	Medium.
Mineralized zone average dimensions, m:			
Length	450.		
Width	300.		
Thickness	10.		
Depth	3.		
Mineral names	Magnetite, scapolite, apatite, chlorite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	<10 km.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit.	Distance to power supply	<50 km.
Year of discovery	1952.		
Discovery method	Ore mineral not in place.		
Initial production	1954.		
Last production	1961.		
Past production	800,000 t prior to 1971 (*454*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

329, 454.	USGS quad maps	Lovelock, 1:250,000. Buffalo Mountain, 15'.
	USBM sequence number	0320270390.
	USGS MRDS number	M060449.

DRY CANYON—ANTIMONY

Alternate names: Antimony No. 4, Beulah, Bray

Commodities: Sb, Ag

LOCATION-OWNERSHIP

County	Lander.	General location	About 13 km southwest of Austin.
Mining district	Big Creek.	Meridian	Mount Diablo.
Elevation	2,505 m.	Tract	Sec. 35, T 18 N, R 43 E.
Topography	Rugged.	Latitude	39°22′51″ N.
Domain	National forest.	Longitude	117°06′41″ W.
Owner	Mary J. Bray (1958).		

GEOLOGY

Type of ore body	Fissure vein.	Host formation	Valmy.
Origin	Hydrothermal.	Geologic age	Ordovician.
Shape of ore body	Tabular.	Rock relationships	Limestone, encloses ore.
Ore controls	Fracturing.	Size	Small.
Strike and dip of mineralized zone.	N 35° W: 55° SW.		
Mineralized zone average dimensions, m:			
Thickness	0.3.		
Mineral names	Stibnite, pyrite, tetrahedrite, sphalerite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	<10 km.
Type of operation	Underground.	Road requirement	<50 km.
Year of discovery	Unknown.	Distance to power supply	<50 km.
Discovery method	Ore mineral in place.	Mill location	No mill.
Initial production	Undetermined.		
Last production	1916–18.		
Past production	272 t of 55% Sb (*376*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

376, 693.

USGS quad maps	Millett, 1:250,000. Austin, 15′.
USBM sequence number	0320150136.

Comments: Some production apparently combined with or reported as output from Antimony King (Last Chance) Mine.

EAST NORTHUMBERLAND—BARITE

Alternate names: Bluestone, IMCO Pit, All Minerals, Liesa, Merry Christmas, Blackstar

Commodites: BaSO$_4$

LOCATION-OWNERSHIP

County	Nye.	General location	About 67 km southeast of Austin.
Mining district	Northumberland.	Meridian	Mount Diablo.
Elevation	2,380 m.	Tract	Sec. 5, T 12 N, R 46 E.
Topography	Rugged.	Latitude	38°53'37" N.
Domain	National forest.	Longitude	116°49'30" W.
Owner-operator	All Minerals Corp., Murray, UT (1983).		

GEOLOGY

Type of ore body	Replacement.	Host formation	Pinecone.
Origin	Sedimentation, metamorphic.	Geologic age	Devonian.
Shape of ore body	Lenticular, irregular.	Rock relationships	Chert, lies over ore. Shale, lies over ore. Mudstone, lies under ore.
Ore controls	Bedding, faulting.		
Strike and dip of mineralized zone.	N 70° E: 10° W.	Size	Medium.
Mineralized zone average dimensions, m:			
Length	1,500.		
Width	100.		
Thickness	15.		
Depth	15.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Active-producer.	Distance to water supply	<10 km.
Type of operation	Surface.	Road requirement	<10 km.
Mining method	Open pit.	Distance to power supply	On-site generation.
		Mill location	On-site.
Year of discovery	1967.	Mill status	Active.
Discovery method	Ore mineral in place.	Milling method	Jigging.
		Process rate	514 t/d.
Initial production	1975.	Product type	Crude barite.
Last production	1983.	Destination	California, Oklahoma, Texas.
Past production	Confidential proprietary data.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

87, 338, 357, 368, 546, 601, 623, 624.

USGS quad maps	Tonopah, 1:250,000. Northumberland Pass, 7.5'.
USBM sequence number	0320230183.
Mid number	2600847.

Comments: The deposit occurs as 3 separate ore bodies: Liesa Group, All Minerals Group, and Merry Christmas Group.

EASY MINER—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elk.
Mining district	Snake Mountain.
Elevation	1,900 m.
Topography	Hilly.
Domain	Public and private.

General location	About 29 km northeast of Wells.
Meridian	Mount Diablo.
Tract	Secs. 11, 12, T 40 N, R 63 E.
Latitude	41°21'45" N.
Longitude	114°48'04" W.

Owner-operator	A. W. Arnold and Associates, Houston, TX (1983).

GEOLOGY

Type of ore body	Sedimentary.
Origin	Syngenetic-diagenetic.
Shape of ore body	Tabular.
Ore controls	Bedding.
Strike and dip of mineralized zone.	North-south: 30° W.
Mineralized zone average dimensions, m:	
Length	120.
Width	90.
Thickness	30.
Depth	0 to 6.
Mineral names	Barite.

Host formation	Valmy.
Geologic age	Ordovician.
Rock relationships	Chert, overlies ore. Argillite, underlies ore. Chert, underlies ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1970's.
Discovery method	Geological.
Initial production	1980.
Last production	1982.
Past production	Confidential proprietary data.

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site (diesel generator).
Mill location	Mine site.
Mill status	Idle.
Milling method	Gravity separation.
Process rate	1,200 t/d.
Product type	3.95 sp gr barite-rich rock.
Distance shipped	Truck—35 km, then rail either 2,000 km or 3,000 km, depending on market.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

226, 546, 612, 669, 716.

USGS quad maps	Wells, 1:250,000. Melandco, 7.5'.
USBM sequence number	0320070887.
Mid number	2601667.

EMERSON—TUNGSTEN

Alternate names: Tempiute, Tem Piute, Lincoln, Wah Chang Tungsten Mine North Tempiute, South Thumb

Commodities: W, Mo, Zn, CaF_2, U

LOCATION-OWNERSHIP

County	Lincoln.
Mining district	Tem Piute.
Elevation	2,013 m.
Topography	Rugged.
Domain	Mixed; private and BLM administered.
General location	About 99 km west of Caliente.
Meridian	Mount Diablo.
Tract	Sec. 36, T 3 S, R 56 E.
Latitude	37°38′28″ N.
Longitude	115°37′49″ W.
Owner	Teledyne, Inc., Los Angeles, CA, 75%; North Tempiute Mining and Development, Hiko, NV, 25% (1981).
Operator	Union Carbide Corp., Mining and Metals Div., Alamo, NV (1984).

GEOLOGY

Type of ore body	Replacement, disseminated, shear zone.
Origin	Contact metasomatic, hydrothermal.
Shape of ore body	Irregular.
Ore controls	Contact zone, lithology.
Strike and dip of mineralized zone.	N 40° E: 60° W.
Mineralized zone average dimensions, m:	
Length	2,000.
Width	500.
Thickness	15.
Depth	0.
Mineral names	Scapolite, tremolite, muscovite, magnetite, bismuth, scheelite, sphalerite, fluorite, molybdenite, garnet, pyrite, pyrrhotite.
Host formation	Guilmette.
Geologic age	Mississippian.
Rock relationships	Limestone, replaced by ore, lies along ore. Hornfels, near ore. Quartzite, near ore. Marble, lies along ore. Skarn (tactite), is ore, gangue.
Size	Large.

DEVELOPMENT

Current status	Active-standby.
Type of operation	Surface-underground.
Mining method	Shrinkage stoping, open pit.
Year of discovery	1916.
Discovery method	Ore mineral in place.
Initial production	1937.
Last production	1981.
Past production	Several million kilograms of tungsten metal recovered.
Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	Inactive.
Milling method	Scheelite flotation.
Product type	WO_3 concentrate.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

52, 69, 137, 231, 271, 343, 553, 724, 738, 800, 843, 848.

USGS quad maps	Caliente, 1:250,000. Tempiute Mountain, 15′.
USBM sequence number	0320170012.
USGS MRDS number	M030087.
Mid number	2600340.

ENFIELD BELL—GOLD

Alternate names: Bell, Jerritt Canyon, Freeport Gold

Commodities: Au

Ore body names: Marlboro Canyon, Alchem, North Generator Hill, Lower Generator Hill, West Generator Hill

LOCATION-OWNERSHIP

County	Elko.
Mining district	Jerritt Canyon.
Elevation	1,925 m.
Topography	Rugged.
Domain	National forest (mine); BLM administered (mill); private.

General location	About 80 km northwest of Elko.
Meridian	Mount Diablo.
Tract	Secs. 33, 34, 35, T 41 N, R 54 E; Sec. 3, T 40 N, R 54 E.
Latitude	41°23'44" N.
Longitude	115°59'39" W.

Owner	Freeport Gold Co., New York, NY (70%) (subsidiary of Freeport-McMoran, Inc., New York, NY); FMC Gold, Inc., Chicago, IL (30%) (1985).
Operator	Freeport Gold Co. (1985).

GEOLOGY

Type of ore body	Disseminated, stratiform, replacement.
Origin	Hydrothermal, oxidation.
Shape of ore body	Tabular, elongate.
Ore controls	Faults, fractures, lithology.
Strike and dip of mineralized zone.	Unknown.
Age of mineralization	Mid-Tertiary.

Ore body dimensions (approximate), m:

	Marlboro	Otherfour ore bodies
Length	1,220.	230 to 760.
Width	120.	60 to 120.
Thickness	110.	Unknown.

Mineral names .... Gold (free), gold (tied to organics), pyrite, realgar, oripiment, arsenopyrite, cinnabar, stibnite, barite, calcite, quartz.

Host formations	Hansen Creek (primary); Roberts Mountains (basal 60 m).
Geologic age	Upper Ordovician. Lower Silurian.
Rock relationships	Hansen Creek: Chert carbonate, jasperoid, lies under ore, lies over ore. Dolomite, above ore. Carbonaceous banded limestone, is ore, lies along ore, gangue. Bioclastic limestone, under ore. Roberts Mountains: Dolomite, lies above ore. Calcareous siltstone, encloses ore, is ore, gangue.
Alteration	Silicification (over ore zone), oxidation and argillic around jasperoid (minor), and carbonization.
Size	Medium.

DEVELOPMENT

Current status	Producer-active.
Type of operation	Surface.
Mining method	Open pit, multiple bench, about 4,400 t/d ore, 23,000 t/d waste; stripping ratio = 7.9:1.
Year of discovery	1971 (anomaly), 1973 (Alchem ore body); 1976 (Marlboro Canyon).
Discovery method	Geochemical, geologic inference, drilling.
Initial production	July 1981.
Past production	426 kg Au (13,700 tr oz) in sales, (1981) (*316*). >6,100 kg (196,000 tr oz) Au (1982) (*435*). 8,150 kg (262,000 tr oz) Au forecast (1984) (*418*).
Annual production rate	6,000 kg (200,000 tr oz) dore annual rated capacity (*435*).

Distance to water supply	3 km to deep wells.
Road requirement	10 km paved plant access.
Distance to power supply	26 km, 120 kV.
Mill location	13 km east of mine (truck).
Mill status	Active.
Milling method	Agitated cyanide leach (pretreatment of carbonaceous ore by preoxidation chlorination); carbon-in-pulp; zinc precipitation; electrolysis.
Process rate	3,040 t/d (3,350 ton/d); original capacity was 2,490 t/d (50% of capacity oxide circuit, 50% carbonaceous circuit).
Product type	Dore bullion bars (about 34 kg each).

PUBLISHED RESERVES-RESOURCES

Class	Quantity	Grade	Year	Reference
1. Proven and probable	11,614,000 tons	0.233 tr oz/ton Au	1983	551
2. Do	13,700,000 tons	0.205 tr oz/ton Au	1984	313

REFERENCES

53, 61, 85, 90, 116, 173, 190, 224, 226, 253, 254, 278, 297, 299, 302, 306, 313, 316, 336, 344, 346, 348, 376, 378, 415, 418, 423, 430, 435, 479, 551, 599, 612, 616, 669, 688, 692, 730, 773, 839.

USGS quad maps	Wells, 1:250,000. California Mountain, 7.5'.
USBM sequence number	0320070879.
Mid number	2601620.

Comments: Mineral zone is in lower plate of Roberts Mountains Thrust Fault. Ore is carbonaceous (50%) and oxide (50%) requiring segregation during milling. Area of 5 ore bodies measures about 1,200 m by 3,300 m, and about 100 m thick.

FANNIE RYAN—MANGANESE

Alternate names: None	Commodities: Mn

LOCATION-OWNERSHIP

County	Clark.	General location	About 24 km southeast of Las Vegas.
Mining district	Las Vegas.	Meridian	Mount Diablo.
Elevation	610 m.	Tract	Sec. 36, T 21 S, R 63 E.
Topography	Rolling.	Latitude	36°05'06" N.
Domain	BLM administered.	Longitude	114°53'27" W.
Owner	United States (managed by BLM) (1980).		

GEOLOGY

Type of ore body	Sedimentary.	Host formation	Muddy Creek.[1]
Origin	Hydrothermal, sedimentation.	Geologic age	Pliocene.
Shape of ore body	Tabular.	Rock relationships	Gypsiferous sandstone, encloses ore, lies over ore. Gravel, lies over ore.
Ore controls	Lithology, faulting.	Size	Small.
Strike and dip of mineralized zone.	N 55° E: 30° W.		
Mineralized zone average dimensions, m:			
Length	300.		
Width	176.		
Thickness	3.7.		
Depth	25.		
Mineral names	Wad.		

DEVELOPMENT

Current status	Inactive-explored.	Distance to water supply	<3 km.
Type of operation	Possible surface.	Road requirement	<10 km.
		Distance to power supply	<10 km.
Year of discovery	1941.	Mill location	No mill.
Discovery method	Ore mineral in place.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES[2]

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. Measured	900 tons	Average: 17.2% Mn; cutoff: 15% Mn	1949	407
2. Do	1,720 tons	Average: 15.7% Mn; cutoff: 12% Mn	1949	407
3. Do	2,380 tons	Average: 14.3% Mn; cutoff: 10% Mn	1949	407
4. Do	3,960 tons	Average: 12.6% Mn; cutoff: 8% Mn	1949	407
5. Do	25,800 tons	Average: 7.6% Mn; cutoff: 5% Mn	1949	407

REFERENCES

354, 386, 407, 547, 721.

USGS quad maps	Las Vegas, 1:250,000. Henderson, 7.5′.
USBM sequence number	0320030008.
USGS MRDS number	M031084.

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[1] Manganiferous zone consists of 3 beds ranging 0.76 to 2.5 m thick.
[2] Tonnages are cumulative.

FENCEMAKER—ANTIMONY

Alternate names: Fenstonmaker, Lucky Lode, S & W

Commodities: Sb

LOCATION-OWNERSHIP

County	Pershing.
Mining district	Table Mountain.
Elevation	1,600 m.
Topography	Rolling.
Domain	BLM administered.

General location	About 53 km east of Lovelock.
Meridian	Mount Diablo.
Tract	Sec. 31, T 26 N, R 37 E.
Latitude	40°04'19" N.
Longitude	117°51'26" W.

Owner	Silver Bell Mining and Developing, Inc., Lovelock, NV (1983).

GEOLOGY

Type of ore body	Shear zone, replacement, disseminated.
Origin	Hydrothermal.
Shape of ore body	Irregular, tabular.
Ore controls	Fracturing, faulting.
Strike and dip of mineralized zone.	N 30° E: 30° E.
Mineralized zone average dimensions, m:	
Length	25.
Width	4.
Thickness	13.
Depth	7.
Mineral names	Stibnite, cinnabar, chalcopyrite, silver, gold, calcite, quartz.

Host formation	Boyer Ranch.
Geologic age	Middle Jurassic.
Rock relationships	Limestone, encloses ore, replaced by ore. Shale, lies over ore, lies under ore
Size	Medium.

DEVELOPMENT

Current status	Past producer-standby.
Type of operation	Underground.
Mining method	Open stope.
Year of discovery	1880.
Discovery method	Ore mineral in place.
Initial production	1880.
Last production	1982.
Past production	1 t Sb metal (*376*).

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill locaton	On-site.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

29, 68, 329, 376, 381, 464, 541, 671, 672.

USGS quad maps	Winnemucca, 1:250,000. Fencemaker, 15'.
USBM sequence number	0320270414.
USGS MRDS number	M055423.
Mid number	2601650.

FISH CREEK—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.	**General location**	About 27 km north of Carlin.
Mining district	Swales Mountain.	**Meridian**	Mount Diablo.
Elevation	1,960 m.	**Tract**	Sec. 2, T 35 N, R 52 E.
Topography	Hilly.	**Latitude**	40°57'10" N.
Domain	Mixed.	**Longitude**	116°06'15" W.

Owner	Maggie Creek Ranch Co., Elko, NV; New Park Resources, Inc., Metairie, LA (1983).

GEOLOGY

Type of ore body	Sedimentary.	**Host formation**	Vinini.
Origin	Sedimentation.	**Geologic age**	Ordovician.
Shape of ore body	Tabular.	**Rock relationships**	Chert, encloses ore. Siltstone, replaced by ore. Sandstone, lies over ore.
Ore controls	Bedding.		
Strike and dip of mineralized zone.	N 50° to 60°E: 10° to 20° W.	**Size**	Large.
Mineralized zone average dimensions, m:			
Length	2,100.		
Width	300.		
Thickness	15.		
Depth	1.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Inactive-explored (extensively drilled).	**Distance to water supply**	<30 km.
Type of operation	Possible surface.	**Road requirement**	<10 km.
		Distance to power supply	<50 km.
Year of discovery	1955.	**Mill location**	No mill.
Discovery method	Ore mineral in place.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

87, 185, 226, 283, 349, 546, 669.

USGS quad maps	Winnemucca, 1:250,000. Swales Mountain, 7.5'.
USBM sequence number	0320070901.

GARNET-TENNESSEE MOUNTAIN—TUNGSTEN

Alternate names: Knowles Bros. Tungsten Claims, Tennessee Mountain Mine, Tennessee Mountain, Garnet Tungsten, Garnet

Commodities: W, Mo

LOCATION-OWNERSHIP

County	Elko.	General location	About 24 km east of Mountain City.
Mining district	Alder.	Meridian	Mount Diablo.
Elevation	2,438 m.	Tract	Sec. 17, T 45 N, R 56 E.
Topography	Rugged.	Latitude	41°47'41" N.
Domain	National forest.	Longitude	115°40'25" W.

Owner	Knowles Bros., 50%; P. D. Montrose, 50% (1981).
Operator	PAB Oil and Mining (1981).

GEOLOGY

Type of ore body	Replacement.	Host formation	Tennessee Mountain.
Origin	Contact metasomatic, metamorphism.	Geologic age	Ordovician.
Shape of ore body	Tabular.	Rock relationship	Limestone, encloses ore, replaced by ore. Shale, encloses ore, replaced by ore. Skarn (tactite), replaced by ore. Hornfels, replaced by ore.
Ore controls	Contact zone, igneous.		
Strike and dip of mineralized zone.	N 50° W: 55° S.		
Mineralized zone average dimensions, m:		Size	Medium.
Length	335.		
Width	53.		
Thickness	8.		
Depth	53.		
Mineral names	Scheelite, powellite, molybdenite, pyrite, chalcopyrite, magnetite, garnet, uraninite, chlorite, epidote.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	On-site.
Type of operation	Underground.	Road requirement	None.
Mining method	Sublevel.	Distance to power supply	>100 km.

Year of discovery	1949.
Discovery method	Ore mineral in place.
Initial production	1970.
Last production	1977.
Past production	Confidential proprietary data.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. Not reported in reference	396,000 tons	0.42% WO_3	1977	526, 527

REFERENCES

70, 91, 139, 154, 226, 278, 526, 527, 669, 733.

USGS quad maps	Wells, 1:250,000. Rowland, 15'.
USBM sequence number	0320070011.
USGS MRDS number	D001177.

GETCHELL—GOLD

Alternate names: None

Commodities: Au, Ag, W, As

LOCATION-OWNERSHIP

County	Humboldt.
Mining district	Potosi.
Elevation	1,707 m.
Topography	Hilly.
Domain	Mixed; private and BLM adminstered.

General location	About 70 km northeast of Winnemucca.
Meridian	Mount Diablo.
Tract	Sec. 33, T 39 N, R 42 E.
Latitude	41°12′59″ N.
Longitude	117°15′23″ W.

Owner .... FRM Minerals, Inc., Denver, CO (subsidiary of First Mississippi Corp., Jackson, MS) (1984).

GEOLOGY

Type of ore body	Disseminated, replacement.
Origin	Hydrothermal.
Shape of ore body	Sheetlike, irregular.
Ore controls	Faulting, fracturing, folding, lithology.
Strike and dip of mineralized zone.	N 25° W: 45° to 90° E.
Age of mineralization	Cretaceous to Miocene (90 million yr).
Mineralized zone average dimensions, m:	
Length	>2,100.
Width	1,000 (downdip).
Thickness	12 (assay walls).
Mineral names	Native gold, quartz (Au), carbon (Au), pyrite (Au), arsenopyrite (Au), calcite, kaolinite, chlorite, realgar, orpiment, cinnabar, stibnite, chalcopyrite, sphalerite, marcasite, magnetite, barite, fluorite, chabasite, getchellite, galkhaite, scheelite.

Host formation	Preble.
Geologic age	Cambrian.
Rock relationships	Gouge (quartz, carbon, clay), is ore, encloses ore, gangue. Argillite, sheared and replaced by gouge, ore in fractures, gangue. Arenaceous limestone, sheared and replaced by gouge, ore in fractures, gangue. Shale, lies over ore, lies under ore. Granodiorite and dacite porphyry dikes, near ore.
Alteration	Silicification, decarbonatization, sericitic, argillic, chlorite.
Size	Small.

DEVELOPMENT

Current status	Active-past producer, exploration.
Type of operation	Surface.
Mining method	Open pit; tailings and dump recovery was being planned by Conoco (see comments).
Year of discovery	1934.
Discovery method	Ore mineral in place.
Initial production	1938.
Last production	1967.
Past production	12,069 kg (388,033 tr oz) Au (1938-50); no production in 1946-47 (*44*). 1,916,910 t (2,113,030 tons), 9.29 g/t (0.271 tr oz/ton) Au (1962-67) (*44*).

Distance to water supply	On-site.
Road requirement	Existing.
Distance to power supply	Existing.
Mill location	On-site.
Mill status	Active (1983).
Milling method	Tailings test-cyanide leach tank, carbon columns.
Process rate	91 t/d.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. .Not reported in reference	3,200,000 tons	0.3 tr oz/ton Au; 0.1 tr oz/ton Ag	1982	690
2. . Do	3,250,000 tons	0.18 tr oz/ton Au	1982	61
Possible	10,000,000 tons	0.16 tr oz/ton Au	1982	61
3. .Proven	1,400,000 tons	0.22 tr oz/t Au	1983	84
4. .Not reported in reference	>750,000 tr oz[1]	Not applicable	1983	201

REFERENCES

43, 44, 45, 47, 61, 67, 79, 81, 84, 174, 201, 232, 242, 243, 269, 270, 285, 292, 308, 334, 335, 336, 364, 425, 616, 628, 656, 690, 702, 773, 801, 807, 808.

USGS quad maps	McDermitt, 1:250,000. Osgood Mountains, 15′.
USBM sequence number	0320130063.
USGS MRDS number	M030027.
Mid number	2601801.

Comments: Gold mineralization has also been observed on the Village Fault, located 300 m east of the Getchell Fault described above. Conoco, Inc. sold the property in 1983. Plans were to dewater and explore the 3 existing pits beginning in mid-1983. Two phases of development were planned: Phase I—heap leaching existing tailings and old mine waste material from 1983 to 1994; Phase II—open pit mining with associated milling operations. Construction was to start in late 1985, with production commencing 1 yr later.

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[1] Company reports "reserves appear to exceed" troy ounce total.

GIBELLINI—MANGANESE

Alternate names: Niganz Manganese-Nickel, Black Iron

Commodities: Mn, Ni, Zn

LOCATION-OWNERSHIP

County	Eureka.	**General location**	About 27 km south of Eureka.
Mining district	Fish Creek.	**Meridian**	Mount Diablo.
Elevation	2,103 m.	**Tract**	Sec. 35, T 16 N, R 52 E.
Topography	Hilly.	**Latitude**	39°12'30" N.
Domain	BLM administered.	**Longitude**	116°05'23" W.
Owner	Louis Gibellini (1976).		

GEOLOGY

Type of ore body	Shear zone, replacement.	**Host formation**	Vinini.
Origin	Hydrothermal, replacement.	**Geologic age**	Lower Devonian.
Shape of ore body	Pipelike, massive.	**Rock relationships**	Limestone, ore in fractures. Sandstone, lies along ore, lies over ore. Shale, near ore, lies along ore. Chert, near ore, lies along ore. Quartzite, near ore, lies along ore.
Ore controls	Fracturing, faulting.		
Strike and dip of mineralized zone.	N 70° E: 30° W.		
Mineralized zone average dimensions, m:			
Length	50.	**Size**	Small.
Width	30.		
Thickness	20.		
Depth	10.		
Mineral names	Psilomelane, pyrolusite.		

DEVELOPMENT

Current status	Inactive-explored.	**Distance to water supply**	<3 km.
Type of operation	Surface, underground.	**Road requirement**	None.
		Distance to power supply	<100 km.
Year of discovery	1942.	**Mill location**	No mill.
Discovery method	Ore mineral in place.		
Past production	No production; 2 car lots shipped in 1953 for testing, averaged 31.7% Mn (*721*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

51, 593, 721.

USGS quad maps	Millett, 1:250,000. Cockalorum Wash, 15'.
USBM sequence number	0320110006.
USGS MRDS number	W000696.

Comments: The manganese-rich material contains equal amounts of pyrolusite and psilomelane; it also contains appreciable amounts of zinc, nickel, and minor amounts of cobalt, copper, vanadium, and molybdenum. An analysis of a metallurgical sample revealed the following in percent (*51*):

Mn	*Fe*	*Ni*	*Co*	*Zn*	*Cu*	*Mo*	V_2O_5	*Ba*	*CaO*	*S*	*Insol*	Al_2O_3
18.5	3.0	1.7	0.3	3.2	0.12	0.11	0.86	3.7	2.3	0.2	41.6	6.0

GOLD QUARRY—GOLD

Alternate names: None

Commodities: Au, Hg

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Maggie Creek.
Elevation	1,658 m.
Topography	Hilly.
Domain	Private, private lease, BLM administered.

General location	About 23 km south-southeast of Carlin Mine.
Meridian	Mount Diablo.
Tract	Sec. 34, 35, T 34 N, R 51 E.
Latitude	40°47′27″ N.
Longitude	116°13′00″ W.

Owner	Newmont Mining Corp., New York, NY (1985).
Operator	Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp.) (1985).

GEOLOGY

Type of ore body	Disseminated.
Origin	Hydrothermal.
Shape of ore body	Pipelike.
Ore controls	Faults; lithology.
Mineralized zone average dimensions (estimated), m:	
Length	620.
Width	460.
Mineral names	Native gold.

Host formation	Vinini (upper plate of Roberts Mountains Thrust Fault).
Geologic age	Ordovician.
Rock relationships	Cherts, contains ore in shears and fractures, gangue. Quartzites, contains ore in shears and fractures, gangue. Siltstones, probable host of new discovery. Carbonates, probable host of new discovery.
Alteration	Silicification (jasperoid), argillic.
Size	Large.

DEVELOPMENT

Current status	Active-development, construction.
Type of operation	Surface.
Mining method	Open pit; will mine about 2.3 million t/a ore.
Year of discovery	1977 (new).
Discovery method	Geological inference, drilling.
Initial production	1936; by Newmont from full-scale test heap leach (about 1982-83); mill production scheduled to commence August 1985.
Past production	54.1 t (59.7 tons), 14.3 g/t (0.417 tr oz/ton) Au, 30.2 g/t (0.88 tr oz/ton) Ag (1936) (*593*). 1,314 kg (42,230 tr oz) from 886,202 t (976,871 tons) ore from test heap leach (1983) (*511*).
Annual producton rate	5,300 kg Au (170,000 tr oz) anticipated beginning August 1985.

Mill location	On-site probable.
Mill status	Development.
Milling method	Cyanide heap leach and cyanide agitated leach, carbon-in-pulp gold recovery.
Process rate	6,120 t/d (6,750 ton/d) ore.
Product type	Dore bars and byproduct Hg.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. . Proven and probable	45,000,000 tons	0.078 tr oz ton/Au (high grade)	1983	511
	89,000,000 tons	0.032 tr oz ton/Au (low grade, stripping ratio 1.6:1)	1983	511
	49,000,000 tons	0.029 tr oz ton/Au (unrecoverable)	1983	511
Total	183,000,000 tons	0.043 tr oz ton/Au (recoverable and unrecoverable)	1983	511

REFERENCES

27, 90, 116, 134, 184, 224, 237, 319, 435, 505, 507, 511, 514, 593, 834.

USGS quad maps	Winnemucca, 1:250,000. Schroeder Mountain, 7.5′.
USBM sequence number	0320110219.
Mid number	2601635.

Comments: Mine-mill construction began in the spring of 1984. Newmont pays royalties of 18% on 87.5% of the mineral rights held by Ash and Thornton. Geology and ore characteristics are reported much the same as at Carlin. In 1982, full-scale heap leaching and milling tests were conducted. Total recoverable high- and low-grade 1983 proven and probable reserves is 134 million tons, 0.048 tr oz/ton Au.

GOLDFIELD—GOLD

Alternate names: Goldfield Project, Pacific Gold and Uranium, Goldfield Consolidated Main Vein

Commodities: Au, Ag (Au-Ag ratio about 3:1)

LOCATION-OWNERSHIP

County	Esmeralda.
Mining district	Goldfield.
Elevation	1,720 m.
Topography	Hilly-mountainous.
Domain	Patented claims.

General location	About 40 km south of Tonopah.
Meridian	Mount Diablo.
Tract	Secs. 25, 26, 36, T 2 S, R 42 E.
Latitude	37°43'30" N.
Longitude	117°13'11" W.

Owner	Davis Goldfield Mining Co. (receives 7.5% net royalty increasing to 10%) (1983).
Lessees	Southern Pacific Land Co., San Francisco, CA, 50%; Noranda Exploration, Inc., Toronto, ON, Canada, 25%; Pacific Gold and Uranium, Inc. (PG & U), Los Angeles, CA 25% (1983).
Operator	Blackhawk Mines Corp. (1984).

GEOLOGY

Type of ore body	Vein systems, replacement.
Origin	Hydrothermal.
Shape of ore bodies	Variable-pipes, lenticular, tabular.
Ore controls	Faults, fractures.
Strike and dip of mineralized zone.	North: 30° to 40° E.
Age of mineralization	Miocene.
Proposed pit average dimensions (estimated), m:	
Length	460.
Width	45.
Thickness	30.
Mineral names	Native gold, famatinite, tetrahedrite-tennantite, bismuthinite, goldfieldite, chalcopyrite, galena, sphalerite, sylvanite, hessite, petzite, calaverite, pyrite, quartz, jasperoid, limonite, halloysite, gypsum.

Host formations	Porphyritic Rhyodacite. Quartz Latite flows and tuffs (Kendall Tuff).
Geologic ages	Lower Miocene. Oligocene.
Rock relationships	Silicified porphyritic rhyodacite, portions are ore, encloses ore (major host). Porphyritic rhyodacite, gangue. Silicified quartz latite, portions are ore, encloses ore. Quartz latite, gangue. Siliceous shale and argillite, lies beneath ore (Ordovician Palmetto Formation). Quartz monzonite, lies beneath ore (Tertiary).
Alteration	Highly bleached and altered—advanced argillization, alunitization, silicification.
Size	Small.

DEVELOPMENT

Current status	Active-developing.
Type of operation	Surface.
Mining method	Open pit (shallow).
Year of discovery	1902 (district); 1981 (option acquired by Noranda and PG & U).
Discovery method	Recent drilling.
Initial production	Anticipated fourth quarter 1984.
Last production	Unknown.
Past production	District—130,326 kg Au; 45,107 kg Ag; 3,479 t Cu; 23 t Pb from 7,021,750 t ore (1903–60). 1948–51 production withheld (*8*).
Annual production rate	About 270,000 t ore.

Distance to water supply	Two 300-gpm wells near plant site.
Road requirement	2.4 km (improvement).
Distance to power supply	3.2 km.
Mill location	Near mine.
Mill status	Development.
Milling method	Anticipated agglomerated cyanide heap leach; zinc precipitation or carbon absorption.
Process rate	About 1,100 t/d ore.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. . Not reported in reference	500,000 tons	0.07 tr oz/ton Au	1980	162
2. . Proven	2,115,000 tons	0.070 tr oz/ton Au	1984	502

REFERENCES

7, 8, 19, 20, 21, 22, 23, 24, 162, 208, 209, 246, 325, 340, 497, 502, 576, 627, 631, 632, 703, 809.

USGS quad maps	Goldfield, 1:250,000. Goldfield, 15'.
USBM sequence number	0320090415.

Comments: Specific geology of the proposed pit area was not available. Geologic data describe the area of the district that will host the proposed development work. Reserve tonnage reported from 3 discrete ore bodies along Goldfield ledge. Reserve cutoff grade is 0.020 tr oz/ton Au.

GOLDSTRIKE—GOLD

Ore body names: Long Lac deposit, Bazza (past open pits: Goldstrike No. 6, Goldstrike No. 9, Pan Cana No. 1, E. P. No. 1, E. P. No. 2)

Commodities: Au, Ag
(Au-Ag ratio = 20:1)

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Lynn.
Elevation	1,700 m.
Topography	Hilly.
Domain	BLM administered.
General location	About 38 km northwest of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 30, T 36 N, R 50 E. Sec. 24, T 36 N, R 49 E.
Latitude	40°58'12" N.
Longitude	116°21'55" W.
Operator	Western States Minerals Corp., Wheat Ridge, CO (in a joint venture partnership with Pan Cana Industries) (1984).

GEOLOGY

Type of ore body	Disseminated.
Origin	Hydrothermal.
Shape of ore body	Tabular to elongated lensoid.
Ore controls	Faulting, fracturing-brecciation, lithology.
Strike of mineralized zone.	N 55° W.
Age of mineralization	Cretaceous (78 million yr).
Mineralized area average dimensions (estimated), m:	
Length	2,100.
Width	1,400.
Thickness	75 to 170..
Depth	10.
Principal minerals	Pyrite (auriferous), marcasite (auriferous), quartz, sericite, kaolinite, montomorillonite, goethite.
Other	Chalcopyrite, scheelite, hematite, garnet, diopsite, tremolite, calcite, barite, jarosite, variscite, chalcedony, alunite, stibnite, aragonite, realgar, orpiment, arsenopyrite, sphalerite.
Host formation	Vinini Formation (most favorable); skarn, latite, dike, granodiorite.
Geologic age	Ordovician (Vinini).
Rock relationships	Argillites (carbonaceous), fractures contain ore. Shales (sometimes carbonaceous), fractures contain ore. Siltstone, fractures contain ore. Quartzite (minor), near ore, gangue. Chert (minor), near ore, gangue. Limestone (rare), gangue. Granodiorite-to-diorite stock, contains ore (Early Cretaceous). Quartz latite and latite dikes, contains ore. Skarn (xenoliths in diorite stock), contains ore. Jasperoid, above ore, near ore.
Alteration	Silicification, argillic, sericite.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit.
Initial production	1976-77 (by Pan Cana Industries).
Past production	About 230 kg Au (1979) (*132*).
Road requirement	None, existing to the site.
Mill location	On-site.
Mill status	Active.
Milling method	Cyanide heap leach.
Process rate	Unknown.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

132, 182, 183, 460, 593, 690.

USGS quad maps	Elko, 1:250,000. Rodeo Creek NE, 7.5'.
USBM sequence number	0320110168.
Mid number	2601089.

Comments: Best mineralization occurs at intersection of high-angle structures and following low-angle structures. About 4 to 5 areas or zones of gold mineralization occur in the mine area. Northwest-trending high-angle faults (pre-mineral) have dominant control over mineralization. Individual mineral zones are 60 to 300 m in length with northwest elongation and 15 to 60 m in width. Both oxide and unoxidized ore exists. Oxide ore is known to exist up to 90 m in depth. Unoxidized sulfide ore has been as shallow as 20 m.

GOOSEBERRY—SILVER

Alternate names: Gooseberry Claims, Red Top Claims

Commodities: Ag, Au

LOCATION-OWNERSHIP

County	Storey.
Mining district	Unorganized.
Elevation	1,646 m.
Topography	Rugged.
Domain	Mixed, private (patented claims); BLM administered (unpatented claims).

General location	About 24 km east of Reno.
Meridian	Mount Diablo.
Tract	Sec. 25, T 19 N, R 22 E.
Latitude	39°29′03″ N.
Longitude	119°27′52″ W.

Owner-operator	Asamera Minerals (U.S.), Inc., Reno, NV (subsidiary of Asamera, Inc., Calgary, AB, Canada), 75% (1984).
Owner	Ican Resources Ltd., Vancouver, BC, Canada, 25% (1984).

GEOLOGY

Type of ore body	Fissure vein, shear zone, disseminated.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting, fracturing.
Strike and dip of mineralized zone.	N 20° W: 80° S.
Age of mineralization	Tertiary.
Vein average dimensions, m:	
Length	>900.
Width	>440 (downdip).
Thickness	2.5.
Mineral names	Electrum, argentite, native gold and silver, pyrite, stephanite, minor galena, chalcopyrite, sphalerite, calcite, quartz, adularia.

Host formation	Kate Peak.
Geologic age	Miocene.
Rock relationships	Dacite porphyry, ore in veins and fractures, gangue. Rhyodacite, ore in veins and fractures, gangue. Flow breccia, near ore. Calcite-quartz-adularia vein, contains ore, gangue. Granodiorite, near ore.
Alteration	Propylitic, argillic.
Size	Small.

DEVELOPMENT

Current status	Active-producer.[1]
Type of operation	Underground.
Mining method	Cut-and-fill stoping (by yearend 1983, 25% of mill feed will be drawn by shrinkage stoping).
Year of discovery	1906.
Discovery method	Surface outcrop.
Initial production	1976, by Westcoast Oil and Gas Corp.; 1983, by Asamera.
Last production	1981, Westcoast Oil and Gas Corp.; Asamera currently producing in 1985.
Past production	15,551 kg Ag (1980) (*165*). 4,959 kg Ag (1981) (*165*). 9,528.7 kg Ag, 216.7 kg Au (1983) (*172*).

Distance to water supply	11 km, pumped from river.
Road requirement	Existing.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	Active.
Milling method	Flotation, cyanidation of concentrate, Merrill-Crowe zinc dust precipitation.
Process rate	320 t/d.
Product type	Pb, Ag, Au precipitate.
Destination	Englehard Industries, Los Angeles, CA.

PUBLISHED RESERVES-RESOURCES

	Class	*Quantity*	*Grade*	*Year*	*Reference*
1	Proven and probable	607,000 tons	9.73 tr oz/ton Ag; 0.23 tr oz/ton Au	1983	101
	Possible	730,000 tons			
2	Reserves	500,000 tons	9 tr oz/ton Ag; 0.25 tr oz/ton Au	1984	537
3	Proven and probable	561,300 tons	10.18 tr oz/ton Ag; 0.26 tr oz/ton Au	1984	504

REFERENCES

66, 90, 101, 165, 172, 378, 412, 470, 504, 528, 537, 597, 607, 695, 783.

USGS quad maps	Reno, 1:250,000. Churchill Butte, 15′.
USBM sequence number	0320290018.
Mid number	2600249.

Comments: Asamera is considering installation of an on-site plant to produce dore bullion from the precipitate. In 1982, Asamera acquired the property from Scurry-Rainbow (subsidiary of Westcoast Oil and Gas Corp.), which had been operating the Gooseberry.

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[1] Gooseberry production was suspended in February 1985 because of depressed metal prices. Exploration and development was reported to continue during the suspension.

GREYSTONE—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Lander.	General location	About 41 km south of Battle Mountain.
Mining district	Bullion.	Meridian	Mount Diablo.
Elevation	2,000 m.	Tract	Sec. 26, T 28 N, R 45 E.
Topography	Hilly.	Latitude	40°16'27" N.
Domain	BLM administered.	Longitude	116°52'21" W.
Owner	Dresser Industries, Dallas, TX (1984).		

GEOLOGY

Type of ore body	Sedimentary, replacement.	Host formation	Slaven Chert.
Origin	Sedimentation.	Geologic age	Devonian.
Shape of ore body	Tabular.	Rock relationships	Chert, encloses ore, gangue. Shale, encloses ore. Limestone, encloses ore.
Ore controls	Bedding, lithology.	Size	Medium.
Strike and dip of mineralized zone.	N 40° W: 30° S.		
Mineralized zone average dimensions, m:			
Length	900.		
Width	110.		
Thickness	90.		
Depth	0.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Active-producer.	Distance to water supply	<3 km.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit.	Distance to power supply	On-site.
		Mill location	On-site.
Year of discovery	1951.	Mill status	Operating.
Discovery method	Ore mineral in place.	Milling method	Crushing, screening, jigging.
		Process rate	1,813 t/d.
Initial production	1954.	Product type	Crushed barite concentrate.
Last production	1983.	Distance shipped	46 km.
Past production	More than 3.6 million t mined, processed, and shipped (*385*).	Destination	Battle Mountain, NV.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

76, 87, 218, 283, 330, 346, 385, 392, 546, 548, 601, 693.		USGS quad maps	Winnemucca, 1:250,000. Mt. Lewis, 15'.
		USBM sequence number	0320150073.
		Mid number	2600411.

Comments: The Greystone is reported to be the largest producing barite mine in the country and one of the largest ever discovered and developed (*385*).

GUNMETAL—TUNGSTEN

Alternate names: Desert Scheelite; Garnet; Lindsay; Summerfield

Commodities: W, Mo, Au

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Shoshone.
Elevation	2,255 m.
Topography	Rugged.
Domain	Private.

General location	About 70 km northwest of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 18, T 6 N, R 37 E.
Latitude	38°23'10" N.
Longitude	117°53'40" W.

Owner	Union Carbide Corp., Danbury, CT (1981).

GEOLOGY

Type of ore body	Replacement.
Origin	Contact metasomatic.
Ore controls	Lithology, faulting.
Mineralized zone average dimensions, m:	
Length	214.
Thickness	15.
Mineral names	Scheelite, garnet, galena, tetrahedrite, molybdenite, sphalerite, quartz, calcite, epidote.

Host formation	Luning.
Geologic age	Triassic.
Rock relationships	Limestone, replaced by ore. Marble, gangue, encloses ore. Skarn (tactite), gangue, encloses ore.
Size	Large.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface-underground.
Year of discovery	1916.
Discovery method	Unknown.
Past production	Confidential proprietary data.

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

223, 343, 444, 596, 608, 733, 740, 774.

USGS quad maps	Tonopah, 1:250,000.
USBM sequence number	0320210054.
USGS MRDS number	M030116.

HARD LUCK-PRADIER—ANTIMONY

Alternate names:	Pradier, Romano, Big Creek	Commodities:	Sb, Ag

LOCATION-OWNERSHIP

County	Lander.	General location	About [illegible] km south of Austin.
Mining district	Big Creek.	Meridian	Mount Diablo.
Elevation	2,804 m.	Tract	Sec. 27, T 17 N, R 43 E.
Topography	Rugged.	Latitude	39°18'17" N.
		Longitude	117°07'57" W.
Owner	Big Creek Mining and Milling Co., Austin, NV (1958).		

GEOLOGY

Type of ore body	Silicified fault breccia.	Host formation	Valmy.
Origin	Hydrothermal.	Geologic age	Ordovician.
Shape of ore body	Tabular, podlike.	Rock relationships	Shale, encloses ore. Slate, encloses ore.
Ore controls	Faulting.		
Strike and dip of mineralized zone.	N 20° W: flat lying.	Size	Small.
Mineral names	Stibnite, malachite, tetrahedrite, azurite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	<10 km.
Type of operation	Underground, surface.	Road requirement	<50 km.
Mining method	Unknown.	Distance to power supply	<50 km.
		Mill location	No mill.
Year of discovery	Prior to 1936.		
Discovery method	Ore mineral in place.		
Initial production	About 1936.		
Last production	1958.		
Past production	68 t Sb metal (*376*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

376, 693.		USGS quad maps	Millett, 1:250,000. Austin, 15'.
		USBM sequence number	0320150193.

Comments: Stibnite occurs as blebs, small pods, and single crystals.

HEAVY SPAR—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.	General location	About 25 km north of Carlin.
Mining district	Swales Mountain.	Meridian	Mount Diablo.
Elevation	1,685 m.	Tract	Sec. 10, T 35 N, R 52 E.
Topography	Hilly.	Latitude	40°56'12" N.
Domain	BLM administered.	Longitude	116°06'51" W.
Owner	New Park Resources, Inc., Metairie, LA (1983).		

GEOLOGY

Type of ore body	Replacement.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Bedding.
Strike and dip of mineralized zone.	N 15° E: 45° W.
Mineralized zone average dimensions, m:	
Length	213.
Width	91.
Thickness	15.
Depth to	15.
Mineral names	Barite.

Host formation	Vinini.
Geologic age	Ordovician.
Rock relationships	Siltstone, replaced by ore. Chert, encloses ore. Shale, encloses ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1953.
Discovery method	Ore mineral in place.
Initial production	1981.
Last production	1983.
Past production	Confidential proprietary data.

Distance to water supply	<3 km.
Road requirement	<10 km.
Distance to power supply	<50 km.
Mill location	No mill.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

87, 185, 226, 283, 349, 546, 669.

USGS quad maps	Winnemucca, 1:250,000. Swales Mountain, 7.5'.
USBM sequence number	0320070098.
Mid number	2601673.

Comments: The property ceased production in 1983 because of depressed barite market conditions. The Heavy Spar may be an extension of the Fish Creek deposit in sec. 2, T 35 N, R 52 E.

HOLLYWOOD—ANTIMONY

Alternate names: Lakeview, Antelope Springs, Lee

Commodities: Sb, Ag

LOCATION-OWNERSHIP

County	Pershing.
Mining district	Antelope Springs (Relief, Pershing).
Elevation	1,390 m.
Topography	Rugged.
Domain	BLM administered.
Owner	Alma D. Priester (1960).

General location	About 29 km east of Lovelock.
Meridian	Mount Diablo.
Tract	Sec. 2, T 26 N, R 34 E.
Latitude	40°08'54" N.
Longitude	118°07'04" W.

GEOLOGY

Type of ore body	Fissure vein.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting, fracturing.
Strike and dip of mineralized zone.	N 35° to 60° W: 60° to 65° NE.
Mineralized zone average dimensions, m:	
Length	>50.
Width	Unknown.
Thickness	0.5.
Depth	0.
Mineral names	Stibnite, pyrite.

Host formation	Grass Valley.
Geologic age	Upper Triassic.
Rock relationships	Calcareous shale, near ore. Limestone, near ore. Siltstone, near ore.
Size	Small.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Underground.
Mining method	Unknown.
Year of discovery	1864.
Discovery method	Ore mineral in place.
Initial production	1916.
Last production	1967.
Past production	464 t Sb metal (*376*).

Distance to water supply	<10 km.
Road requirement	<3 km.
Distance to power supply	<50 km.
Mill location	Ore shipped to Austin, NV, for milling in 1967.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

329, 376, 718.

USGS quad maps	Lovelock, 1:250,000. Buffalo Mountain, 15'.
USBM sequence number	0320270361.
USGS MRDS number	M060417.

Comments: Principal period of production from the Hollywood Mine was during World War I.

HORSE CANYON—GOLD

Alternate names: None

Commodities: Au

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Cortez-Mill Canyon.
Elevation	2,530 m.
Topography	Rugged.
Domain	BLM administered.

General location	About 100 km southwest of Elko.
Meridian	Mount Diablo.
Tract	Sec. 3, T 26 N, R 48 E (unsurveyed).
Latitude	40°08′50″ N.
Longitude	116°32′45″ W.

Owners	Placer U.S., Inc., San Francisco, CA (subsidiary of Placer Development, Ltd., Vancouver, BC, Canada); Kennecott Copper Corp., Salt Lake City, UT; Vernon F. Taylor, Jr. (1984).
Operator	Cortez Gold Mines (operational entity of Placer U.S., Inc.) (1984).

GEOLOGY

Type of ore body	Disseminated.
Origin	Hydrothermal.
Ore controls	Faults, fractures, lithology.
Planned pit size	27 ha (68 acres).
Mineral names	Native gold, quartz, iron oxides, clays, barite, jasperoid, jarosite.

Host formation	Vinini (upper plate of Roberts Mountains Thrust Fault).
Geologic age	Ordovician.
Rock relationships	Shale, in part cherty and carbonaceous, ore host. Siltstone, ore host. Rhyolite dikes, near ore, intrudes host (Miocene). Silicified jasperoid breccia, hosted in Vinini.
Alteration	Silicification, iron staining, bleaching.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface, mine rate about 660,000 t/a ore; stripping ratio is about 3:1 (waste:ore).
Mining method	Open pit.
Initial production	February 1983 (mining); May 1983 (milling).
Annual production rate	600 kg (20,000 tr oz) Au (1983); then 1,200 kg (40,000 tr oz) Au thereafter.

Distance to water supply	On-site at Cortez.
Road requirement	About 22 km to Cortez mill.
Distance to power supply	Existing to Cortez mill.
Mill location	Cortez mill (22 km haulage from mine).
Mill status	Active.
Milling method	Agitated tank cyanide leach (CIL-carbon in leach), carbon columns, pressure stripping, electrolysis-steel wool, smelting.
Process rate	1,800 t/d (2,000 ton/d).
Product type	Dore buttons.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. . Not reported in reference	3,121,000 t	1.89 g/t Au	1982	564
2. . Do	3,400,000 tons	0.055 tr oz/ton Au	1983	169

REFERENCES

27, 84, 90, 100, 169, 170, 219, 426, 513, 564, 593, 692, 780, 781, 785.

USGS quad maps	Winnemucca, 1:250,000. Cortez, 15′.
USBM sequence number	0320110228.

Comments: The Horse Canyon ore is milled at the Cortez mill. The Cortez gold deposit was mined until 1973 when mining operations shifted west to Placer Amex's Gold Acres gold deposit across the valley. Mining and milling continued until February 1976. Cortez and Gold Acres dumps were leached to 1980. In 1980, mining on other Cortez and Gold Acres dumps began; Cortez material was leached and Gold Acres material milled. Horse Canyon ore replaced output from Gold Acres low-grade dumps in May 1983. The Cortez dumps were still actively being mined and leached in late 1983. Company reported mine life is less than 5 yr from 1983.

INDIAN SPRINGS—TUNGSTEN

Alternate names: None

Commodities: W

LOCATION-OWNERSHIP

County	Elko.	General location	About 82 km northeast of Wells.
Mining district	Delano.	Meridian	Mount Diablo.
Elevation	2,047 m.	Tract	Sec. 10, T 43 N, R 68 E.
Topography	Rugged.	Latitude	41°37'29" N.
Domain	Mixed; private and BLM administered.	Longitude	114°14'46" W.

Owner	Norman Ludwig; AZL Resources, Inc., Phoenix, AZ; Utah International, Inc., San Francisco, CA (1981).
Operator	Utah International, Inc. (1981).

GEOLOGY

Type of ore body	Stockwork, replacement.	Host formation	Pequop.
Origin	Hydrothermal, contact metasomatic.	Geologic age	Upper Permian.
Shape of ore body	Irregular.	Rock relationships	Sandstone, ore in fractures, replaced by ore.
Ore controls	Contact zone, igneous.		
Strike and dip of mineralized zone.	N 30° E: 90° E.	Size	Large.
Mineralized zone average dimensions, m:			
Length	1,524.		
Width	150.		
Thickness	30.		
Depth	30.		
Mineral names	Scheelite, garnet, powellite, pyrite, chalcopyrite, molybdenite, galena, sphalerite, tetrahedrite, chalcocite, argentite, bornite, covellite, magnetite, goethite.		

DEVELOPMENT

Current status	Inactive-developed deposit.	Distance to water supply	On-site.
		Road requirement	None.
Year of discovery	1951.	Distance to power supply	<50 km.
Discovery method	Ore mineral in place.		
Initial production	None.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. Not reported in reference	43,600,000 tons	0.164% WO_3	1970	147
2. Do	13,900,000 tons	0.265% WO_3	1970	147

REFERENCES

147, 226, 278, 538, 661, 669.

USGS quad maps	Wells, 1:250,000. Delano Mountain, 15'.
USBM sequence number	0320070016.
USGS MRDS number	D002193.

JUNGLE—BARITE

Alternate names: Jungle A & B, Boies, Consolation, Jungle Extension, Ala

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.
Mining district	Snake Mountains.
Elevation	2,135 m.
Topography	Hilly.
Domain	Mixed; patented mining claims and located mining claims on public lands administered by BLM.
Owner-operator	Chromelloy American Corp., St. Louis, MO (1983).

General location	About 48 km northeast of Wells.
Meridian	Mount Diablo.
Tract	Sec. 7, T 42 N, R 62 E.
Latitude	41°32'30" N.
Longitude	114°59'42" W.

GEOLOGY

Type of ore body	Sedimentary.
Origin	Sedimentation, hydrothermal.
Shape of ore body	Tabular, irregular.
Ore controls	Bedding, lithology.
Strike and dip of mineralized zone.	Flat lying.
Mineralized zone average dimensions, m:	
Length	>180.
Width	170.
Thickness	8.5.
Depth	35.
Mineral names	Barite.

Host formation	Valmy.
Geologic age	Ordovician.
Rock relationship	Chert, encloses ore. Shale, encloses ore. Conglomerate, encloses ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer (standby).
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1955.
Discovery method	Ore mineral in place.
Initial production	1977.
Last production	1981.
Past production	Confidential proprietary data.

Distance to water supply	>10 km.
Road requirement	None.
Distance to power supply	<50 km.
Mill location	Off-site 18 km east.
Mill status	Standby.
Milling method	Crushing, screening, jigging.
Product type	Unground barite concentrate.
Distance shipped	70 km to Wells, NV, by truck; then 2,350 km to Cyril, OK, by rail.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

77, 95, 123, 205, 226, 278, 546, 669, 688, 716, 775, 778.

USGS quad maps	Wells, 1:250,000. Boies Reservoir, 7.5'.
USBM sequence number	0320070357.
Mid number	2601098.

KAY–BARITE

Alternate names:	None
Commodities:	$BaSO_4$

LOCATION-OWNERSHIP

County	Nye.
Mining district	Northumberland.
Elevation	2,620 m.
Topography	Rugged.
Domain	National forest.

General location	About 56 km southeast of Austin.
Meridian	Mount Diablo.
Tract	Sec. 14, T 13 N, R 45 E.
Latitude	38°57′50″N.
Longitude	116°51′58″ W.

Owner	Chromalloy American Corp., St. Louis, MO (1983).

GEOLOGY

Type of ore body	Replacement
Origin	Sedimentation.
Shape of ore body	Irregular.
Ore controls	Bedding, faulting.
Strike and dip of mineralized zone.	N 45° E: 10° W.
Mineralized zone average dimensions, m:	
Length	Unknown.
Width	Unknown.
Thickness	1.5.
Depth	11.
Mineral names	Barite.

Host formation	Pinecone.
Geologic age	Devonian.
Rock relationships	Chert, encloses ore Shale, encloses ore. Greenstone, encloses ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-explored.
Type of operation	Possible surface.
Year of discovery	1958.
Discovery method	Ore mineral in place.
Initial production	No production.

Distance to water supply	On-site.
Road requirement	On-site.
Distance to power supply	<10 km.
Mill location	No mill.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

338, 357, 368, 546, 623, 624.

USGS quad maps	Tonopah, 1:250,000. Northumberland, 7.5′.
USBM sequence number	0320230719.

LAKES–BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.	General location	About 46 km north of Carlin.
Mining district	Lakes.	Meridian	Mount Diablo.
Elevation	2,220 m.	Tract	Sec. 1, T 37 N, R 51 E.
Topography	Hilly.	Latitude	41°06'06" N.
Domain	Private.	Longitude	116°11'36" W.

Owner .... 25 Corporation, Lincoln, NE; NL Baroid (a division of NL Industries, Inc., New York, NY–lessee) (1983).

GEOLOGY

Type of ore body	Bedded.	Host formation	Vinini.
Origin	Replacement.	Geologic age	Ordovician.
Shape of ore body	Tabular, massive.	Rock relationships	Chert, lies under ore, replaced by ore. Tuffs, lies over ore.
Strike and dip of mineralized zone.	S 45° W: 5° S.	Size	Large.
Mineralized zone average dimensions, m:			
Length	320		
Width	185.		
Thickness	45.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	On-site.
Type of operation	Surface.	Road requirement	<10 km.
Mining method	Open pit.	Distance to power supply	<10 km.
		Mill location	No mill.
Year of discovery	1955.		
Discovery method	Ore mineral in place.		
Initial production	1973.		
Last production	1981.		
Past production	Confidential proprietary data.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference..	8,000,000 tons	4.10 sp gr	1982	304

REFERENCES

87, 226, 304, 546, 669.	USGS quad maps	McDermitt, 1:250,000. Lake Mountain, 7.5'.
	USBM sequence number	0320070354.
	Mid number	2600959.

Comments: Ownership of the Lakes deposit has been the subject of 2.5 yr of litigation. In June 1982, the Nevada Supreme Court ruled in favor of NL Industries.

LINKA–TUNGSTEN

Alternate names: Garnetite, Spruce Mountain, Toiyabe Claims

Commodities: W, Mo

LOCATION-OWNERSHIP

County	Lander.	General location	About 27 km southeast of Austin.
Elevation	1,800 m.	Meridian	Mount Diablo.
Domain	BLM administered.	Tract	Sec. 18, T 17 N, R 45-1/2 E.
		Latitude	39°19'00" N.
		Longitude	116°50'00" W.
Owner	Consolidated Uranium Mines, Inc., Salt Lake City, UT (1972).		

GEOLOGY

Type of ore body	Replacement, shear zone.	Host formation	Antelope Valley.
Origin	Contact metasomatism, hydrothermal.	Geologic age	Ordovician.
Shape of ore body	Irregular.	Rock relationships	Marble, lies along ore. Hornfels, lies along ore. Limestone, replaced by ore. Skarn, is ore, gangue.
Ore controls	Lithology, contact zone.		
Mineralized zone average dimensions, m:			
Length	153.	Size	Small.
Width	12.		
Thickness	46.		
Mineral names	Scheelite, quartz, garnet, epidote, calcite, molybdenite, pyrite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	<3 km.
Type of operation	Surface-underground.	Distance to power supply	<50 km.
Year of discovery	1941.		
Discovery method	Ore mineral in place.		
Past production	Confidential proprietary data.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

404, 693, 733.

USGS quad maps	Millett, 1:250,000. Spencer Hot Springs, 15'.
USBM sequence number	0320150011.
USGS MRDS number	M030019.

MAGGIE CREEK–GOLD

Ore body names: Main, West

Commodities: Au

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Maggie Creek (Schroeder).
Elevation	1,603 m.
Topography	Hilly.
Domain	Mixed, private, private lease, BLM administered.

General location	About 11 km north of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 4, T 34 N, R 51 E.
Latitude	40°51'49" N.
Longitude	116°14'47" W.

Owner	Newmont Mining Corp., New York, NY (1985).
Operator	Carlin Gold Mining Co. (subsidiary of Newmont Mining Corp.) (1985).

GEOLOGY

Type of ore body	Disseminated, replacement, stratiform.
Origin	Hydrothermal, oxidation.
Shape of ore body	Tabular.
Ore controls	High-angle fault, northeast-trending fracture zone, lithology.
Strike of mineralized zone.	About N 30° E.
Age of mineralization	Mid-Tertiary.

Mineralized zone average dimensions, m:

	Main	West
Length	730	120
Width	60 to 180	120
Thickness	40 (estimated)	40 (estimated)

Pit area	85.7 ha (210 acres).
Mineral names	Native gold, pyrite, quartz, clays, carbon (not associated with gold), barite, chert, illite, kaolinite, montmorillonite.

Host formation	Roberts Mountains (upper plate of Roberts Mountains Thrust Fault).
Geologic age	Upper Silurian.
Rock relationships	Argillaceous dolomitic limestone, ore in fractures, replaced by ore, gangue. Siltstone, ore in fractures, replaced by ore, gangue. Shale, ore in fractures, replaced by ore, gangue. Sandstone, ore in fractures, gangue.
Alteration	Silicification, decarbonation, argillization.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit, about 15,000 t/d ore and waste mined. Mining began in July 1980.
Year of discovery	1976–77.
Discovery method	Geological inference, drilling.
Initial production	April 1981 (leach facility commissioned).
Past production	987.19 kg (31,739 tr oz) Au from 240,794 t (265,430 tons) ore treated (1983) (*511*).
Annual production	450,000 t (500,000 tons) leaching grade ore; estimated 220,000 t (240,000 tons) milling grade.

Distance to water supply	On-site wells.
Road requirement	23 km to Carlin mill.
Distance to power supply	On-site diesel electric generation, 1,300 kW (four 275-kW units, one 200-kW standby unit).
Mill location	Heap leach–on-site; milling ore to Carlin mill.
Mill status	Active.
Milling methods	Leaching grade ore–cyanide agglomeration, cyanide heap leach, carbon adsorption, electrolysis, smelting. Milling grade–agitated cyanide leach, CCD, Merrill-Crowe zinc precipitation.
Process rate	Leaching grade–2,300 t/d (450,000 t/a). Milling grade–1,040 t/d is trucked and processed at Carlin mill.
Product type	Dore bullion approximately 950 fine.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	4,350,000 t[1]	3.20 g/t Au (milling plus leaching grade)	1980	435
2..Proven and probable	3,606,000 tons	0.079 tr oz/ton Au	1983	511
Above contains	2,202,000 tons	0.037 tr oz/ton Au	1983	511

REFERENCES

27, 59, 90, 129, 184, 319, 398, 400, 435, 505, 508, 511, 593, 688, 832.

USGS quad maps	Winnemucca, 1:250,000. Schroeder Mountain, 7.5'.
USBM sequence number	0320110182.
Mid number	2601635.

Comments: Maggie Creek deposit adjoins the Gold Quarry property.

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[1] Published reserves consist of about 2.09 million t, 5.14 g/t Au milling grade ore, and 2.26 million t, 1.3 g/t Au leaching grade. Anticipated last year of production is 1986.

MAMMOTH–FLUORINE

Alternate names: Star Mine, Perkins Claim, Perkins Prospect, Pine Creek Prospect, Carlson Prospect, Rocket Group and Big Jim, Jumbo Prospect, Horseshoe, Northern Horseshoe, Higrade, White Horse, North Star Group

Commodities: CaF_2

LOCATION-OWNERSHIP

County	Nye.
Mining district	Quinn Canyon Range.
Elevation	2,256 m.
Topography	Hilly.
Domain	National forest.
Owner	Norman E. Wood (1976).

General location	About 101 km west of Caliente.
Meridian	Mount Diablo.
Tract	Sec. 2, T 3 N, R 56 E.
Latitude	38°09'04" N.
Longitude	115°39'20" W.

GEOLOGY

Type of ore body	Breccia fill, replacement.
Origin	Hydrothermal.
Shape of ore body	Irregular, lenticular.
Ore controls	Lithology, contact zone.
Strike and dip of mineralized zone.	N 15° E: 15° to 30° W.
Mineralized zone average dimensions, m:	
Length	229.
Width	30.
Thickness	30.
Mineral names	Fluorspar, jasper, calcite.

Host formation	Antelope Formation.
Geologic age	Ordovician.
Rock relationships	Limestone, ore in fractures, replaced by ore.
Host formation	Shingle Pass.
Geologic age	Tertiary.
Rock relationships	Unspecified extrusive, ore in fractures.
Host formation	Needles Range.
Geologic age	Tertiary.
Rock relationships	Unspecified extrusive, ore in fractures.
Size	Medium.

DEVELOPMENT

Current status	Inactive-explored prospect.
Type of operation	Surface.
Year of discovery	1943.
Discovery method	Ore mineral in place.

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

281, 283, 357, 545, 604, 733, 815, 816.

USGS quad maps	Lund, 1:250,000.
USBM sequence number	0320230202.

MANHATTAN–GOLD

Related names: Houston Oil & Minerals Manhattan (HIMCO) Project Claim Group includes Big Four, Mayflower, Reilly Fraction, Iron Queen, Iron King, Gold Wedge, Little Grey, Jumping Jack, June, St. George, Stray Dog, Skookum

Commodities: Au, Ag

LOCATION-OWNERSHIP

County	Nye.
Mining district	Manhattan.
Elevation	1,290 m.
Topography	Hilly.
Domain	Private.

General location	About 56 km northeast of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 23, T 8 N, R 44 E.
Latitude	38°32'19" N.
Longitude	117°00'31" W.

Owner-operator	Tenneco Minerals Corp., Inc., Houston, TX (1985). (Mining is by contractor--W.E. Vining, Carson City, NV.)

GEOLOGY

Type of ore body	Disseminated, stockwork-quartz veining.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faults, fractures (joints).
Age of mineralization	Miocene (16 million yr.)
Mineral names	Free gold, electrum, quartz, calcite, adularia, manganese oxide, pyrite, iron oxide.

Host formation	Gold Hill.
Geologic age	Cambrian.
Rock relationships	Schist, ore in fractures, gangue. Pyrite, shale, ore in fractures, gangue. Quartzite, sandstone, ore in fractures, gangue.
Alteration	Pyritization.
Size	Small.

DEVELOPMENT

Current status	Active-producer
Type of operation	Surface.
Mining method	Open pit (by contract); about 2,700 t/d ore.
Year of discovery	1866, silver first discovered in district; 1905, gold discovered.
Discovery method	Geochemical, drilling.
Initial production	1980 by HIMCO; late 1983 for Tenneco.
Last production	Late 1982 by HIMCO; ongoing for Tenneco (1985).
Annual production rate	Between 810 kg Au and 840 kg Au anticipated (26,000 to 27,000 tr oz).

Distance to water supply	On-site.
Road requirement	Existing.
Distance to power supply	Unknown.
Mill location	On-site.
Mill status	Active.
Milling method	Gravity concentration, flotation, batch cyanide agitated leach, Merrill-Crowe zinc precipitation.
Process rate	Crusher about 2,700 t/d; flotation about 1,369 t/d.
Product type	Au-Ag precipitate.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1...**Proven**	5,000,000 tons	0.036 tr oz/ton Au	1983	311

REFERENCES

90, 136, 191, 192, 194, 311, 357, 368, 378, 494, 584, 719, 768.

USGS quad maps	Tonopah, 1:250,000. Manhattan. 7.5'.
USBM sequence number	0320230395.
Mid number	2601566.

Comments: The mine was temporarily shut down between January 1982 and fall of 1983.

McARTHUR–COPPER

Alternate names: None

Commodities: Cu

LOCATION-OWNERSHIP

County	Lyon.	**General location**	About 45 km southeast of Carson City.
Mining district	Mason.	**Meridian**	Mount Diablo.
Elevation	1,438 m.	**Tract**	Sec. 25, T 14 N, R 24 E.
Topography	Gentle.	**Latitude**	39°02'56" N.
Domain	Mixed; private and BLM administered.	**Longitude**	119°14'17" W.

Owner	The Anaconda Minerals Co., Denver, CO (a wholly owned subsidiary of Atlantic Richfield Co., Denver, CO) (1979).

GEOLOGY

Type of ore body	Replacement, breccia fill.	**Host formation**	Igneous intrusive.
Origin	Contact metasomatic, hydrothermal.	**Geologic age**	Mesozoic.
Shape of ore body	Unknown.	**Rock relationships**	Quartz monzonite, replaced by ore, gangue. Breccia, encloses ore, gangue.
Ore controls	Igneous, fracturing, faulting.	**Size**	Large.
Strike of mineralized zone.	N 70° W.		
Mineral names	Chalcocite, pyrite, chalcopyrite, cuprite, malachite.		

DEVELOPMENT

Current status	Inactive-explored prospect.	**Distance to water supply**	<10 km.
Discovery method	Trenching, drilling.	**Road requirement**	<10 km.
Last production	1943.	**Distance to power supply**	<10 km.
Past production	Reported 5 carloads ore shipped in 1943 (*695*).		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	13,000,000 tons	0.43% Cu	1976	822

REFERENCES

126, 128, 453, 567, 695, 822, 824.

USGS quad maps	Reno, 1:250,000. Wabuska, 15'.
USBM sequence number	0320190023.

Comments: Extensive exploration done by the Bureau in 1948–50; further drilling done by Anaconda Co. in 1974.

McDERMITT–MERCURY

Alternate names: None	Commodities: Hg

LOCATION-OWNERSHIP

County	Humboldt.	General location	About 10 km southwest of McDermitt.
Mining district	Opalite (Cordero).	Meridian	Mount Diablo.
Elevation	1,402 m.	Tract	Sec. 27, T 47 N, R 37 E.
Topography	Flat.	Latitude	41°55′13″ N.
Domain	Mixed; BLM administered, public lands-private.	Longitude	117°48′37″ W.

Owner-operator	Placer U.S. Inc., San Francisco, CA (subsidiary of Placer Development Ltd., Vancouver, BC, Canada), 51% (1983).
Owner	Sterling Mineral Venture, 49% (1983).

GEOLOGY

Type of ore body	Sedimentary, replacement.	Host formation	Tuffaceous sediment (lake beds).
Origin	Hydrothermal, sedimentation.	Geologic age	Miocene.
Shape of ore body	Tabular overall.	Rock relationships	Clay, is ore, encloses ore. Chert, under ore, is ore.
Ore controls	Faulting, bedding.		
Strike and dip of mineralized zone.	N 45° W: 4° E.	Alteration	Argillic.
Age of mineralization	Miocene.	Size	Medium.
Mineralized zone average dimensions, m:			
Length	760.		
Width	670.		
Thickness	6.		
Depth	30.		

Mineral names .... Cinnabar, corderoite, montmorillonite, chalcedony, iron and manganese oxides, calcite, cristobalite, gypsum, alunite, apatite, stibnite, alpha tridynite.

DEVELOPMENT

Current status	Active-producer.	Distance to water supply	On-site wells.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit; overall stripping ratio is about 4.7:1 waste:ore.	Distance to power supply	On-site.
		Mill location	On-site.
		Mill status	Active.
Year of discovery	1941 (drill penetration of ore body).	Milling method	Flotation, distillation.
Discovery method	Geological inference.	Process rate	2,200 t/d ore, 90 t/h (furnace--0.45 t/h Hg concentrate).
Initial production	1975 (stripping began in 1974).	Product type	Refined mercury.
Past production	237,000 t, 4.51 kg/t Hg ore milled; 489,000 kg Hg metal production (1981) (*564*). 273,000 t, 4.06 kg/t Hg ore milled; 452,000 kg Hg metal production (1982) (*564*).	Distance shipped	4,348 km.
		Destination	New York, NY, and various other national locations.
Annual production rate	About 240,000 t ore and 20,000 flasks.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Indicated	3,000,000 tons	10 lb Hg/ton	1976	596
2..Measured	1,648,000 t	0.5 wt pct Hg	1980	563
3.. Do	1,410,000 t	5.15 kg/t Hg	1981	564
4.. Do	1,202,000 t	4.44 kg/t Hg	1982	564

REFERENCES

7, 29, 104, 202, 229, 276, 406, 466, 468, 474, 563, 564, 596, 602, 615, 639, 642, 643, 673, 725, 801, 845.

USGS quad maps	McDermitt, 1:250,000. Jordan Meadows, 15′.
USBM sequence number	0320130259.
USGS MRDS number	MO54731.
Mid number	2600646.

Comments: Largest mercury producer in the United States. Individual ore bodies are asymmetric lenslike bodies that thin and decrease in grade away from hot spring centers of mineralization. Reported final pit depth will be about 50 m. The ore body is estimated to contain 400,000 flasks of mercury.

McGILL TAILINGS—COPPER

Alternate names: Keystone Dumps

Commodities: Cu

LOCATION-OWNERSHIP

County	White Pine.	**General location**	About 19 km northeast of Ely.
Mining district	Robinson Canyon.	**Meridian**	Mount Diablo.
Elevation	1,865 m.	**Tract**	Sec. 29, T 18 N, R 64 E.
Topography	Gentle.	**Latitude**	39°23′55″ N.
Domain	Private.	**Longitude**	114°47′44″ W.
Owner	Kennecott Copper Corp., Salt Lake City, UT (1984).		

GEOLOGY

Type of ore body	Mill waste, tailings.	**Identified resources**	Medium.

DEVELOPMENT

Current status	Inactive-explored.	**Distance to water supply**	On-site.
Mining method	Surface.	**Road requirement**	None.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	40,000,000 to 80,000,000	0.3 to 0.4% Cu	1979	413

REFERENCES

160, 284, 413, 473, 477.

USGS quad maps	Ely, 1:250,000. McGill, 15′.
USBM sequence number	0320330056.

Comments: The tailings deposit at McGill represents a 70-yr accumulation of tailings from the adjacent concentrator. Over the years the "natural classification of the coarse and heavy particles resulted in a deposit of minable grade copper-bearing material suitable for concentrating and smelting" (*473*). In 1978–79, Kennecott conducted exploration and feasibility studies on the deposit. In the fall of 1979, Kennecott announced that recovery of copper from about 800 ha (2,000 acres) awaited only a corporate go-ahead. It was stated that an investment of $15 million would be required and would "pay for itself in less than a year" (*160*). The plan was to use conveyors to transport 9.5 million t (10.5 million tons) annually back to the mill and smelter facilities for reprocessing. Recycling of the 0.5% Cu tailings would take between 8 and 10 yr (*160*).

MINNESOTA—IRON

Alternate names: Standard Slag Mine, Minnesota Copper Lode Claim

Commodities: Fe

LOCATION-OWNERSHIP

County	Douglas.
Mining district	Buckskin.
Elevation	1,823 m.
Topography	Hilly.
Domain	Mixed; private and BLM administered.

General location	About 38 km southeast of Carson City.
Meridian	Mount Diablo.
Tract	Sec. 19, T 14 N, R 24 E.
Latitude	39°04'04" N.
Longitude	119°20'00" W.

Owners	V. Cox; J. Adams; A. J. Hawkins; M. Russell; L. J. Anderson; Standard Slag Co., Reno, NV (1975).

GEOLOGY

Type of ore body	Replacement.
Origin	Contact metasomatic.
Shape of ore body	Irregular.
Ore controls	Faulting, lithology.
Mineralized zone average dimensions, m:	
Length	244.
Width	152.
Thickness	122.
Mineral names	Magnetite, hematite, dolomite, pyrite, chalcopyrite, martite, magnesite, malachite, chlorite, sericite.

Host formation	Sedimentary Series.
Geologic age	Triassic.
Rock relationships	Dolomite. replaced by ore, gangue.
Size	Small.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Mining method	Surface.
Year of discovery	1900.
Discovery method	Auxiliary mineral in place.
Initial production	1916.
Last production	1967.
Past production	4,000,000 t ore and concentrate through 1967 (*454*).

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	On-site.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

296, 381, 453, 454, 580.

USGS quad maps	Reno, 1:250,000. Como, 15'.
USBM sequence number	0320050021
USGS MRDS number	W016379.

MODARELLI—IRON

Alternate names: Amarilla Deposit, Requa Mine, Simplot Mine

Commodities: Fe

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Modarelli.
Elevation	2,067 m.
Topography	Very rugged.
Domain	Private.
Owner	Linda and Vincent Modarelli (1981).
Owner-operator	J. R. Simplot Co., Boise, ID (1981).

General location	About 39 km south of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 30, T 29 N, R 51 E.
Latitude	40°21'59" N.
Longitude	116°15'44" W.

GEOLOGY

Type of ore body	Replacement, stockwork.
Origin	Contact metasomatic.
Shape of ore body	Irregular.
Ore controls	Faulting.
Strike and dip of mineralized zone.	N 45° W: 60° N.
Mineral names	Hematite, magnetite, quartz, calcite, apatite.

Host formation	Older Volcanic Series.
Geologic age	Oligocene.
Rock relationships	Tuff, near ore, Dacite, near ore. Latite, near ore. Rhyolite, replaced by ore, ore in fractures. Andesite, lies under ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Year of discovery	1903.
Discovery method	Ore mineral in place.
Initial production	1951.
Last production	1959.
Past production	406,000 t mined between 1951–59 (*454*).

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..**Indicated**	44,000,000 long tons	42.75% Fe, 1.05% P_2O_5	1971	454

REFERENCES

10, 75, 150, 235, 282, 324, 332, 366, 454, 462, 536, 568, 583, 593, 625, 733, 751.

USGS quad maps	Winnemucca, 1:250,000. Frenchie Creek, 15'.
USBM sequence number	0320110028.
USGS MRDS number	W016363.

MONTANA MOUNTAINS—LITHIUM

Alternate names: McDermitt Caldera Lithium; Kings River Lithium; Uravada

Commodities: Li, U

LOCATION-OWNERSHIP

County	Humboldt.	General location	About 48 km southwest of McDermitt.
Mining district	None; closest is Opalite (McDermitt), 38 km northeast.	Meridian	Mount Diablo.
		Tract	Sec. 24, T 45 N, R, 34 E.
Elevation	2,080 m.	Latitude	41°45'44" N.
Domain	Public, BLM administered.	Longitude	118°06'29" W.

Owners	J. M. Huber Corp., Macon, GA (1984); Chevron Resources, Denver, CO (1984); Jim and Grace LeBret, Frank and Ann Bengoa, Orovada, NV (1984); Norman LeBret, Priscilla Vaagen, George and Lynn LeBret, Spokane, WA (1984).

GEOLOGY

Type of ore body	Volcanic moat deposits.	Host formation	Tuffaceous sediments.
Origin	Hydrothermal, hot springs.	Geologic age	Tertiary.
Shape of ore body	Tabular.	Rock relationships	Hectorite, is ore.
Ore controls	Hot springs vent zones, moat sediments.	Alteration	Zeolite.
Strike and dip of mineralized zone.	Horizontal.	Size	Large.
Age of mineralization	Tertiary.		
Mineralized zone average dimensions, m:			
Length	15,000.		
Width	1,000.		
Thickness	75.		
Depth	75.		
Mineral names	Smectite, calcite, chalcedony, analcime.		

DEVELOPMENT

Current status	Active-exploration.	Distance to water supply	5 km
Type of operation	Possible surface.	Road requirement	Paved haul road.
Mining method	Open pit.	Distance to power supply	5 km.
Year of discovery	1979.		
Discovery method	Field mapping, drilling.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

108, 125, 155, 221, 244, 379, 396, 397, 602, 603, 638, 801.

USGS quad maps	McDermitt, 1:250,000. Disaster Peak, 15'.
USBM sequence number	0320130482.

Comments: Potentially the largest single lithium resource in the United States containing a drill-hole-indicated resource of 200 million t averaging 1.2% Li_2O.

MOUNT HOPE—MOLYBDENUM

Alternate names: Whim Shaft, Lorraine Workings, Nevada Morn Prospect

Commodities: Mo, Zn, Cd, Pb, Cu, Ag, Au

LOCATION-OWNERSHIP

County	Eureka.	General location	About 34 km southeast of Eureka.
Mining district	Mt. Hope.	Meridian	Mount Diablo.
Elevation	2,240 m.	Tract	Sec. 18, T 22 N, R 52 E.
Topography	Rugged.	Latitude	39°47'15" N.
Domain	BLM administered.	Longitude	116°09'29" W.
Owner	EXXON Corp., New York, NY (1982).		

GEOLOGY

Type of ore body	Stockwork, disseminated porphyry molybdenum.	Host formation	Quartz porphyry (major host).
Origin	Contact metasomatic, hydrothermal.	Geologic age	Mid-Tertiary.
Shape of ore body	Stockwork.	Size	Large.
Ore controls	Igneous, faulting, fracturing.		
Pit average dimensions (proposed), km:			
Length	2.		
Width	1.75.		
Mineral names	Molybdenite; other minerals unknown.		

DEVELOPMENT

Current status	Active-developing-exploration.	Distance to water supply	16 km.
Type of operation	Surface (proposed).	Road requirement	None.
Mining method	Open pit; mining 27,000 t/d ore, using large electric shovels was proposed.	Distance to power supply	32 km.
		Mill location	On-site.
		Mill status	Proposed.
Year of discovery	1870 (Pb and Zn); 1981 (Mo discovery announced).	Milling method	Concentrator, hydrometallurgical, conversion plant (proposed).
Discovery method	Drilling, geochemistry.	Product type	Molybdic acid, ferromolybdenum (proposed).
Initial production	1886.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	450,000,000 tons	0.13% to 0.32% MoS_2	1981	383

REFERENCES

383, 395, 448, 593, 793, 813, 837.

USGS quad maps	Millett, 1:250,000. Garden Valley, 15'.
USBM sequence number	0320110037.
USGS MRDS number	W016396.
Mid number	2601132.

Comments: Molybdenum was first observed in a drill hole drilled by Phillips Petroleum in 1970–71. The higher grade mineralization is reported to occur where the asymmetric halos of alteration and molybdenum mineralization merge around 2 deep coaxial stocks. Molybdenite has been reported to occur at depths ranging from 46 m to 960 m.

MOUNT WHEELER—BERYLLIUM

Alternate names: Pole Adit

Commodites: Be, CaF$_2$, W

LOCATION-OWNERSHIP

County	White Pine.	General location	About 60 km southeast of Ely.
Mining district	Mt. Washington.	Meridian	Mount Diablo.
Elevation	2,377 m.	Tract	Sec. 16, T 12 N, R 68 E.
Topography	Very rugged.	Latitude	38°53′50″ N.
Domain	National forest.	Longitude	114°20′16″ W.
Owner	Mt. Wheeler Mines, Inc., Salt Lake City, UT (1983).		

GEOLOGY

Type of ore body	Replacement, fissure vein, shear zone.	Host formation	Pioche Shale.
Origin	Unknown.	Geologic age	Cambrian.
Shape of ore body	Lenticular.	Rock relationships	Limestone, replaced by ore. Shale, lies over ore. Shale, lies under ore.
Ore controls	Fracturing, bedding.		
Mineralized zone average dimensions, m:		Size	Large.
Length	1,000.		
Width	8.		
Thickness	5.		
Depth	0.		
Mineral names	Phenacite, fluorite, scheelite, beryl, bertrandite.		

DEVELOPMENT

Current status	Inactive-developed.	Distance to water supply	On-site.
Type of operation	Possible underground.	Road requirement	None.
		Distance to power supply	<10 km.
Year of discovery	1959.	Mill location	No mill.
Discovery method	Auxiliary minerals in place.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

119, 122, 249, 250, 275, 284, 359, 679, 797, 798.

USGS quad maps	Lund, 1:250,000. Wheeler Peak, 15′.
USBM sequence number	0320330039.
USGS MRDS number	D001197.

MOUNTAIN SPRINGS—BARITE

Alternate names: FMC Mine

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Lander.
Mining district	Mountain Springs.
Elevation	1,563 m.
Topography	Rolling.
Domain	Mixed, BLM administered.

General location	About 39 km south of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 8, T 28 N, R 44 E.
Latitude	40°13'25" N.
Longitude	117°02'26" W.

Owner	FMC Corp. Inc., Chicago, IL (1984).
Operator	FMC Corp. Inc.; IMCO Services—milling (a wholly owned subsidiary of Halliburton Co., Dallas, TX) (1984).

GEOLOGY

Type of ore body	Sedimentary.
Origin	Sedimentation.
Shape of ore body	Tabular.
Ore controls	Bedding, lithology.
Strike and dip of mineralized zone.	N 30° W: 45° S.
Mineralized zone average dimensions, m:	
Length	244.
Width	36.
Thickness	30.
Depth	0.
Mineral names	Barite.

Host formation	Slaven.
Geologic age	Devonian.
Rock relationships	Chert, lies over ore, encloses ore. Limestone, lies over ore.
Size	Large.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1947.
Discovery method	Ore mineral in place.
Initial production	1952.
Last production	Ongoing.
Past production	Confidential proprietary data.

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	Producer-standby.
Milling method	([1]).
Process rate	FMC—63,000 t/a; IMCO—400,000 t/a.
Product type	Crushed concentrated barite.
Distance shipped	44 km.
Destination	Battle Mountain, NV.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

78, 87, 131, 173, 315, 330, 346, 347, 385, 392, 546, 548, 601, 683, 693, 735.

USGS quad maps	Winnemucca, 1:250,000. McCoy, 15'.
USBM sequence number	0320150072.
Mid number	2600401.

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[1] FMC Corp. operates a small crushing and screening plant; IMCO Services operates a large beneficiation plant. The IMCO plant incorporates jigging, tabling, and flotation concentrating techniques.

NEVADA MOLY—MOLYBDENUM

Alternate names: Anaconda-Nevada Moly Prospect, Hall Copper, Hall Hand Property, Liberty Mine, San Antonio Mine, Hall Molly

Commodites: Mo, Cu, Ag, Au

LOCATION-OWNERSHIP

County	Nye.	General location	About 27 km northwest of Tonopah.
Mining district	San Antone.	Meridian	Mount Diablo.
Elevation	1,798 m.	Tract	Sec. 5, T 5 N, R 42 E.
Topography	Hilly.	Latitude	38°19'23" N.
Domain	Mixed.	Longitude	117°17'31" W.

Owner-operator .... The Anaconda Minerals Co., Denver, CO (a wholly owned subsidiary of Atlantic Richfield Co., Denver, CO) (1984).

GEOLOGY

Type of ore body	Replacement, stockwork, disseminated.	Host formation	Valmy.
Origin	Hydrothermal, oxidation.	Geologic age	Ordovician.
Shape of ore body	Pipelike, cylindrical.	Rock relationships	Quartz porphyry, is ore. Metamorphosed sediments, ore in fractures, along bedding planes.
Ore controls	Contact zone, igneous, faulting.		
Strike and dip of mineralized zone.	N 45° E: 15° to 50° E.	Size	Large.
Mineralized zone average dimensions, m:			
Length	760.		
Width	760.		
Thickness	40.		
Depth	3.		
Mineral names	Creedite, chalcopyrite, pyrite, sphalerite, chalcocite, molybenite, pyrrhotite, malachite, azurite, powellite, limonite, galena.		

DEVELOPMENT

Current status	Active-producer.[1]	Distance to water supply	On-site.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit, conventional truck and shovel with 14-m benches.	Distance to power supply	On-site.
		Mill location	On-site.
Year of discovery	1863.	Mill status	Operating.
Discovery method	Ore mineral in place.	Milling method	Two-product bulk flotation.
		Process rate	20,000 t/d (full capacity).
Production	Full production capabilities reached in December 1981.	Product type	MoS_2 concentrate to leach plant; Cu concentrate to smelter. MoS_2 product capacity is estimated 7,260 t/a.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	455,000,000 t	0.072% Mo, 0.06% Cu	1983	736

REFERENCES

26, 161, 181, 196, 279, 310, 355, 357, 368, 402, 420, 469, 472, 475, 599, 608, 619, 736, 759, 813, 837, 842.

USGS quad maps	Tonopah, 1:250,000. San Antonio Ranch, 15'.
USBM sequence number	0320230005.
USGS MRDS number	M030038.

Comments: Eighty percent of resource is in the quartz porphyry intrusive.

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[1] The Nevada Moly Mine indefinitely suspended operations in January 1985 because of poor market conditions.

NEVADA SCHEELITE—TUNGSTEN

Alternate names: Leonard Mine

Commodities: W, Cu, Mo

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Regent-Rawhide.
Elevation	1,555 m.
Topography	Hilly.
Domain	BLM administered.

General location	About 58 km northeast of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 1, T 13 N, R 32 E.
Latitude	39°01'00" N.
Longitude	118°19'30" W.

Owner-operator	Natural Resources Development Ltd., Reno, NV (subsidiary of NRD Mining, Ltd., Vancouver, BC, Canada) (1982).

GEOLOGY

Type of ore body	Shear zone, replacement.
Origin	Contact metasomatic, hydrothermal.
Shape of ore body	Tabular, irregular.
Ore controls	Contact zone, lithology.
Strike and dip of mineralized zone.	N 25° E: 80° E.
Mineralized zone average dimensions, m:	
Length	2,000.
Width	20.
Mineral names	Scheelite, wollastonite, garnet, pyrite, chalcopyrite, molybdenite, magnetite, epidote, calcite.

Host formation	Luning.
Geologic age	Triassic.
Rock relationships	Granite, lies along ore, lies over ore. Skarn (tactite), is ore. Limestone, lies along ore, replaced by ore. Hornfels, lies along ore, near ore. Tuff, near ore.
Size	Large.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Underground.
Mining method	Overhand square set.
Year of discovery	1930.
Discovery method	Ore mineral in place.
Initial production	1937.
Last production	1982.
Past production	301,000 stu[1] of WO$_3$ (*704*).

Distance to water supply	<10 km.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site; mill dismantled 1984.
Product type	WO$_3$ concentrate (65%).
Distance shipped	90 km by truck.
Destination	Fallon, NV (Kennametal).

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

215, 275, 598, 704, 733, 740, 774.

USGS quad maps	Reno, 1:250,000. Big Kasock Mountain, 7.5'.
USBM sequence number	0320210033.
Mid number	2600614.

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[1] stu = short ton unit = 20 lb of contained WO$_3$.

NORTHUMBERLAND—GOLD

Alternate names: Cyprus Northumberland
Ore body names: Chipmunk, Main

Commodities: Au, Ag
(Au-Ag ratio = 2:1)

LOCATION-OWNERSHIP

County	Nye.
Mining district	Northumberland.
Elevation	2,600 m.
Topography	Rugged.
Domain	National forest.

General location	About 120 km northeast of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 24, T 13 N, R 45 E (unsurveyed).
Latitude	38°57'29" N.
Longitude	116°50'44" W.

Owner-operator .... Cyprus Northumberland Mining Co., Austin, NV (subsidiary of Amoco Metals Co., Englewood, CO) (1983).

GEOLOGY

Type of ore body	Disseminated, stratabound, replacement.
Origin	Hydrothermal.
Shape of ore body	Irregular, relatively tabular or flat.
Ore controls	Faults, igneous contact, fractures, lithology.
Strike of mineralized zone.	West-northwest.
Age of mineralization	Late Cretaceous (84.6 million yr).
Mineralized zone average dimensions	
Length	1,100.
Width	240.
Thickness	18 to 21.
Depth	0 to 9 (Main).
Mineral names	Gold, arsenopyrite, pyrite, stibnite, realgar, orpiment, cinnabar, calcite, quartz, jasperoid, dolomite, barite, carbon.

Host formations	Vinini. Roberts Mountains.
Geologic ages	Ordovician. Silurian.
Rock relationships	Tuff, lies above ore. Carbonaceous shales, contains disseminated gold (Vinini). Calcareous siltstone, contains disseminated gold (Vinini). Jasperoid replaced limestone, portions are ore, lies above ore. Jurassic granitic intrusive, occurs as sills in host rocks, is mineralized.
Alteration	Silicification, argillic (Paleozoic), sericitic (intrusive).
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Conventional open pit; mine about 4,500 t/d ore.
Year of discovery	1936 (low-grade gold in district).
Discovery method	Surface sampling and drilling.
Initial production	Early 1981 (Cyprus-Amoco).
Annual production rate	About 620 kg Au (20,000 tr oz).

Distance to water supply	On-site, 3 wells at mill.
Distance to power supply	On-site, diesel electric generator.
Mill location	Off-site, 14 km.
Mill status	Active.
Milling method	Cyanide heap leach, carbon adsorption columns, stripping, electro-winning, smelting.
Process rate	Crusher—4,500 t/d (5,000 ton/d), 5 d/wk.
Product type	Au-Ag dore bullion.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Proven	6,000,000 tons	0.065 tr oz/ton Au	1979	831
2..Not reported in reference	17,000,000 tons	0.045 tr oz/ton Au	1981	61

REFERENCES

60, 61, 207, 222, 232, 338, 357, 368, 403, 404, 405, 461, 480, 539, 599, 601, 616, 623, 624, 630, 692, 752, 761, 773, 831.

USGS quad maps	Tonopah, 1:250,000. Northumberland Pass, 7.5'.
USBM sequence number	0320230403.
Mid number	2601661.

Comments: Ore reportedly occurs in and adjacent to a thrust fault separating lower plate Roberts Mountains Formation from upper plate Vinini Formation. Amoco 1983 operational plans were to mine the Main ore body to completion in 1985, then mine the Chipmunk ore body from 1985 to 1993. The crusher is co-located with the ore bodies; crushed ore is hauled west to the leaching facility at the mouth of West Northumberland Canyon in Big Smoky Valley. Ore heaps for leaching will be constructed at the rate of 5 to 6 per year. Heaps measure about 1,000 m long, 46 m wide, and 6 m high.

NYCO—FLUORINE

Alternate names: Spar #1 – 3

Commodities: CaF_2

LOCATION-OWNERSHIP

County	Nye.	General location	About 117 km west of Pioche.
Mining district	Quinn Canyon Range.	Meridian	Mount Diablo.
Elevation	2,560 m.	Tract	Sec. 34, T 3 N, R 55 E.
Topography	Hilly.	Latitude	38°04′42″ N.
Domain	National forest.	Longitude	115°46′05″ W.

Owner	C. Solan, 33%; W. Stable, 33%; Don W. Terrill, 33% (1981).
Operator	Teledyne Wah Chang (subsidiary of Teledyne Industries, Los Angeles, CA) (1957).

GEOLOGY

Type of ore body	Fissure vein, breccia fill.	Host formation	Shingle Pass Tuff.
Origin	Hydrothermal.	Geologic age	Tertiary.
Shape of ore body	Lenticular.	Rock relationships	Tuff, ore in fractures.
Ore controls	Faulting.	Size	Medium.
Strike and dip of mineralized zone.	N 80° E: 49° N.		
Mineralized zone average dimensions, m:			
Length	91.		
Width	91.		
Thickness	9.		
Mineral names	Fluorite, sericite, kaolinite, quartz, pyrite.		

DEVELOPMENT

Current status	Inactive-past producer.	Road requirement	<10 km.
Type of operation	Underground.	Distance to power supply	<50 km.
Year of discovery	1950.		
Discovery method	Ore mineral in place.		
Initial production	1951.		
Last production	Undetermined.		
Past production	998 t.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

281 283, 357, 545, 604, 733, 815, 816.

USGS quad maps	Lund, 1:250,000.
USBM sequence number	0320230201.

OVERTON—MAGNESITE

Alternate names: None

Commodities: MgO

LOCATION-OWNERSHIP

County	Clark.
Mining district	Overton.
Elevation	463 m.
Topography	Hilly.
Domain	BLM administered.
Owner	Laura Gentry, Las Vegas, NV (1983).

General location	About 20 km southeast of Moapa.
Meridian	Mount Diablo.
Tract	Sec. 34, T 16 S, R 67 E.
Latitude	36°30'05" N.
Longitude	114°29'04" W.

GEOLOGY

Type of ore body	Sedimentary.
Origin	Sedimentation.
Shape of ore body	Tabular, lenticular.
Ore controls	Bedding.
Strike and dip of mineralized zone.	N 20° W: 34° E.
Mineralized zone average dimensions, m:	
Length	3,000.
Width	18.
Thickness	90.
Depth	12.
Mineral names	Magnesite, quartz, feldspar, plagioclase, dolomite.

Host formation	Horse Spring.
Geologic age	Tertiary.
Rock relationships	Siltstone, lies under ore. Dolomite, replaced by ore, gangue. Siltstone, lies over ore. Conglomerate, lies over ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1915.
Discovery method	Ore mineral in place.
Initial production	Unknown.
Last production	Unknown.
Past production	Small—data not available.

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	<10 km.
Mill location	No mill.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	850,000 tons[1]	38% MgO (minimum)	1936	266
2.. Do	3,700,000 tons[1]	34% MgO (minimum)	1936	266
3.. Do	5,100,000 tons[1]	30% MgO (minimum)	1936	266

REFERENCES

266, 386.

USGS quad maps	Las Vegas, 1:250,000. Overton, 15'.
USBM sequence number	0320030011.

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[1] In beds 6 in. or more thick. Tonnages are cumulative.

P & S—BARITE

Alternate names: Old Soldier Mine

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Nye.
Mining district	Northumberland.
Elevation	2,440 m.
Topography	Rugged.
Domain	National forest.
Owner	Standard Slag Co., Reno, NV (1983).

General location	About 62 km southeast of Austin.
Meridian	Mount Diablo.
Tract	Sec. 14, T 13 N, R 45 E.
Latitude	38°58'11" N.
Longitude	116°52'47" W.

GEOLOGY

Type of ore body	Stratiform.
Origin	Sedimentation, metamorphism.
Shape of ore body	Lenticular.
Ore controls	Bedding.
Strike and dip of mineralized zone.	N 45° E: 15° E.
Mineralized zone average dimensions, m:	
Length	160.
Width	135.
Thickness	36.
Depth	50.
Mineral names	Barite.

Host formation	Pinecone.
Geologic age	Middle Devonian.
Rock relationships	Chert, encloses ore, gangue. Quartzite, encloses ore, gangue. Siltstone, encloses ore, gangue. Shale, encloses ore, gangue. Dacite, near ore.
Size	Medium.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1961.
Discovery method	Unknown.
Initial production	1977.
Last production	1985.
Past production	713,782 t ore (1978–80) (*16*).

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	<100 km.
Mill location	Fallon, NV.
Mill status	Active.
Milling method	Flotation.
Process rate	130 t/d.
Product type	Crushed barite.
Distance shipped	695 km.
Destination	Bakersfield, CA.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

16, 87, 338, 357, 368, 546, 623, 624.

USGS quad maps	Tonopah, 1:250,000. Jet Springs, 7.5'.
USBM sequence number	0320230716.
Mid number	2600623.

PAN AMERICAN—LEAD-ZINC

Alternate names: St. Patrick Mining Co.

Commodities: Zn, Pb, Ag, Au, Mn, Fe

LOCATION-OWNERSHIP

County	Lincoln.
Mining district	Comet.
Elevation	1,964 m.
Topography	Rugged.
Domain	Mixed.
Owner	Resco International, Houston, TX (1983).

General location	About 15 km southwest of Pioche.
Meridian	Mount Diablo.
Tract	Sec. 9, T 1 S, R 66 E.
Latitude	37°52'16" N.
Longitude	114°36'19" W.

GEOLOGY

Type of ore body	Replacement, fissure vein.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Bedding, faulting.
Strike and dip of mineralized zone.	North-south: 10° E.
Mineralized zone average dimensions, m:	
Length	430.
Width	200.
Thickness	5.
Depth	250.
Mineral names	Sphalerite, galena, psilomelane, pyrolusite.

Host formation	Combined Metals Member of Pioche Shale.
Geologic age	Lower Cambrian.
Rock relationships	Shale, lies over ore, near ore. Limestone, lies over ore, replaced by ore. Lamprophyre, lies along ore, lies over ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Underground.
Mining method	Room and pillar.
Year of discovery	1929.
Discovery method	Ore mineral in place.
Initial production	1947.
Last production	1978.
Past production	Confidential proprietary data.

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill location	Pan American ore was concentrated at the Caselton mill during its last period of production.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Proven[1]	2,196,000 tons	Pb, 1.17%; Zn, 2.45%; Ag, 2.07% (sic)	1982	168

REFERENCES

168, 216, 274, 322, 720, 721, 724, 791.

USGS quad maps	Caliente, 1:250,000. Bennett Pass, 7.5'.
USBM sequence number	0320170045.
USGS MRDS number	M032032.
Mid number	02600229.

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[1] Reserves listed under St. Patrick Mining Co., Inc.

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PHELPS-STOKES—IRON

Alternate names: Iron Mountain Claims, Stokes Iron Mine,
Phelps-Stokes Iron Deposit

Commodities: Fe

LOCATION-OWNERSHIP

County	Nye.
Mining district	Gabbs.
Elevation	1,865 m.
Topography	Gentle.
Domain	Mixed, private.

General location	About 80 km northeast of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 21, T 12 N, R 37 E.
Latitude	38°53′14″ N.
Longitude	117°49′45″ W.

Owner	Grace Church; Standard Slag Co., Reno, NV (1975).
Operator	Standard Slag Co. (1975).

GEOLOGY

Type of ore body	Replacement.
Origin	Contact metasomatic.
Shape of ore body	Irregular.
Ore controls	Faulting, lithology, contact zone.
Strike and dip of mineralized zone.	N 75° W: 60° N.
Mineralized zone average dimensions, m:	
Length	550.
Width	61.
Thickness	122.
Mineral names	Magnetite, pyrite, pyrrhotite, hematite, gypsum, chlorite, sericite, actinolite, phlogopite, kaolin, calcite, augite, quartz, feldspar.

Host formation	Luning.
Geologic age	Upper Triassic.
Rock relationships	Shale, lies above ore. Dolomite, encloses ore.
Size	Small.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1902.
Discovery method	Ore mineral in place.
Initial production	1949.
Last production	1957.
Past production	1,200,000 t shipping grade ore and concentrates (*454*).

Distance to water supply	<10 km.
Road requirement	None.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

357, 368, 454, 580, 750.

USGS quad maps	Tonopah, 1:250,000. Paradise Peak, 15′.
USBM sequence number	0320230155.

PINSON—GOLD

Alternate names: Ogee-Pinson

Commodities: Au, Ag,
Hg (recovered byproduct)

LOCATION-OWNERSHIP

County	Humboldt.
Mining district	Potosi.
Elevation	1,500 m.
Topography	Hilly.
Domain	Private.

General location	About 64 km northeast of Winnemucca.
Meridian	Mount Diablo.
Tract	Sec. 32, T 38 N, R 42 E.
Latitude	41°07'45" N.
Longitude	117°17'30" W.

Owner	J. S. Livermore, P. E. Galli, D. M. Duncan (21%); Lacana Mining, Inc. (26.25%); Rayrock Mines, Inc. (26.5%); United Siscoe Mines, Inc. (26.25%); all of Toronto, ON, Canada (1985).
Operator	Pinson Mining Co., Winnemucca, NV (1985).

GEOLOGY

Type of ore body	Disseminated, breccia fill, replacement
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting, fractures, lithology.
Strike and dip of mineralized zone.	Northeast: 40° to 50° E.
Age of mineralization	Late Cretaceous (90 million yr).
Mineralized zone average dimensions, m:	
Length	370.
Width	130 (downdip).
Thickness	65.
Depth	About 5.
Mineral names	Gold, quartz, chalcedony, pyrite, marcasite, sericite, kaolinite, calcite, jasper, cinnabar.

Host formation	Comus.
Geologic age	Ordovician.
Rock relationships	Thin-bedded siltstone and limestone, contains lower grade ore. Massive limestone, replaced by ore, lies above ore. Jasperoid breccia, replaces limestone above, is ore (major host). Andesite dikes, near ore (altered to clay). Phyllitic shale, lies beneath ore and is fault footwall (Cambrian Preble Formation).
Alteration	Silicification (ore zone), seritization (wallrock), oxidation.
Size	Small.

DEVELOPMENT

Current status	Active-producer, exploration.
Type of operation	Surface.
Mining method	Open pit; about 1.200 t/d ore and 17,000 t/d waste mined.
Year of discovery	1945; again in 1971.
Discovery method	1945—outcrop; 1971—geological inference and drilling.
Initial production	January 1981 (milling); late 1982 (heap leaching). Expected mine life is 10 yr.
Past production	About 91,000 t ore, shipped to Getchell Mine (1949–50) (*318*). 110,440 t ore mined (1980) (*16*). 340,937 t ore milled; 1,753.3 kg Au recovered (1981) (*372*). 450,663 t ore milled; 2,200 kg Au recovered (1982) (*372*). 1,700 kg Au recovered (1983) (*523*); 1,900 kg Au forecast (1984) (*523*).
Annual production rate	About 1,741 kg Au (56,000 tr oz).

Distance to water supply	<10 km.
Road requirement	<1 km.
Distance to power supply	<1 km (road and powerline to Getchell Mine runs very near Pinson).
Mill location	On-site.
Mill status	Active.
Milling method	Cyanide heap leach. Cyanide pretreatment, carbon column-agitated leach, CIP, electrolysis, smelting.
Process rate	1,360 t/d (1,500 ton/d) (1983).
Product type	Dore bullion bars; 34 to 41 kg each, 950 to 975 fine (mercury recovery is 0.9 kg per cathode, 12 to 14 cathodes are refined per shift).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Indicated	3,245,000 tons	0.105 tr oz/ton Au (diluted mill grade)	1980	640
2.. Do	5,000,000 tons	0.025 tr oz/ton Au (leach grade)	1980	554
3..Proven	3,000,000 tons	0.093 tr oz/ton Au (mill grade)	1983	667
Do	2,400,000 tons	0.026 tr oz/ton Au (leach grade)	1983	667

REFERENCES

16, 47, 79, 83, 90, 173, 204, 269, 285, 290, 292, 318, 372, 378, 412, 435, 439, 443, 482, 523, 525, 554, 555, 560, 561, 566, 578, 640, 662, 667, 713, 770, 773, 801.

USGS quad maps	McDermitt, 1:250,000. Osgood Mountains, 15'.
USBM sequence number	0320130220.
Mid number	2601597.

Comments: Two pits are planned for development. Huttl (*292*) reports 3,760 t ore assaying 6.38 g/t Au was produced at the Ogee-Pinson. Original rated mill capacity in 1980 was 907 t/d (1,000 ton/d). In 1983, exploration drilling resulted in additional indicated resource along the mineral zone extension. The new discovery is fairly deep and narrow.

PIUTE—IRON

Alternate names: None	Commodities: Fe

LOCATION-OWNERSHP

County	Pershing.	General location	About 20 km southeast of Lovelock.
Mining district	Wildhorse.	Meridian	Mount Diablo.
Elevation	1,207 m.	Tract	Sec. 25, T 25 N, R 32 E.
Topography	Gentle.	Latitude	40°00'30" N.
Domain	Federal.	Longitude	118°20'30" W.

Owner	C. W. Hunley, 60%; E. L. and H. C. Stephenson, 30%; R. W. and L. M. Belanger, 10% (1975).

GEOLOGY

Type of ore body	Breccia fill, replacement, disseminated.	Host formation	Star Peak Group.
Origin	Contact metasomatic.	Geologic age	Triassic.
Shape of ore body	Pipelike.	Rock relationships	Breccia, replaced by ore, ore in fractures. Andesite, encloses ore. Marble, replaced by ore.
Ore controls	Fracturing.		
Mineralized zone average dimensions, m: Depth	230.	Size	Large.
Mineral names	Magnetite, pyrite, calcite, alabanite.		

DEVELOPMENT

Current status	Inactive-explored prospect.	Distance to water supply	>10 km.
Type of operation	Possible surface.	Road requirement	None.
		Distance to power supply	<10 km.
Year of discovery	1952.		
Discovery method	Geophysical anomaly.		
Past production	None.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.[1]

REFERENCES

329, 454.	USGS quad maps	Lovelock, 1:250,000. Lovelock, 15'.
	USBM sequence number	0320270382.
	USGS MRDS number	M060441.

Comments: Southern Pacific Land Co. owns adjacent odd numbered sections.

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[1] Moore reports (*454*) "...an enormous quantity of material containing more than 20 percent iron, a very large quantity averaging more than 30 percent iron, and substantial quantity containing more than 50 percent iron."

PREBLE—GOLD

Alternate names: None	Commodities: Au

LOCATION-OWNERSHIP

County	Humboldt.	General location	About 27 km due east of Winnemucca.
Mining district	Potosi.	Meridian	Mount Diablo.
Elevation	1,430 m.	Tract	Sec. 18, T 36 N, R 41 E.
Topography	Hilly.	Latitude	40°58'23" N.
Domain	Private.	Longitude	117°24'00" W.

Owner	D. M. Duncan, P. E. Galli, J. S. Livemore, 21%; Lacana Mining, Inc., 26.25%; United Siscoe Mines, Inc., 26.25%; Rayrock Mines, Inc., 26.5%; all of Toronto, ON, Canada (1985).
Operator	Pinson Mining Co., Winneucca, NV (1985).

GEOLOGY

Type of ore body	Disseminated, replacement.	Host formation	Preble.
Origin	Hydrothermal, shear zone.	Geologic age	Cambrian.
Shape of ore body	Tabular.	Rock relationships	Massive limestone, replaced by ore, gangue. Carbonaceous calcareous shale, replaced by ore, gangue (principal host). Dolomite, in area, but not associated with gold. Andesite sills (altered to clay), lies beneath ore, lies between ore horizons. Granodiorite, near ore.
Ore controls	Faulting, lithology.		
Strike and dip of mineralized zone.	Northeast: 30° SE.		
Age of mineralization	Late Cretaceous.		
Mineralized zone average dimensions (main ore body), m:			
Length	300.		
Thickness	96.		
Excavation depth	360 (planned).		
Mineral names	Gold, pyrite, clay, limonite, geothite, lepidocrocite, quartz, chalcopyrite.	Alteration	Silicification, oxidation.
		Size	Small.

DEVELOPMENT

Current status	Active-producer.	Mill location	Pinson Mine and on-site heap leach.
Type of operation	Surface.	Mill status	Pinson mill active.
Mining method	Open pit.	Milling method	Pinson is carbon column, agitated leach, CIP.
Year of discovery	1972.	Process rate	See Pinson abstract.
Discovery method	Float and outcrop chip sampling; geochemical.	Product type	Ore.
		Distance shipped	About 24 km by truck.
		Destination	Pinson mill.
Initial production	Fourth quarter 1984.		
Annual production rate	330,000 t ore anticipated.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Indicated	1,340,000 tons	0.08 tr oz/ton Au (leach grade)	1980	554
2..Not reported in reference	1,242,000 tons	0.073 tr oz/ton Au	1983	372
3.. Do	1,800,000 tons	0.062 tr oz/ton Au	1984	770

REFERENCES

175, 176, 177, 178, 179, 180, 198, 204, 372, 435, 439, 443, 482, 554, 560, 561, 578, 611, 640, 770, 801.	USGS quad maps	Winnemucca, 1:250,000. Golconda, 7.5'.
	USBM sequence number	0320130443.

Comments: The mineralized zone can be traced for at least 1,200 m along strike.

PRINCE—LEAD-ZINC

Alternate names:	Virginia Louise, Davidson (Prince Consolidated Mining Co.)	Commodities:	Zn, Pb, Ag, Au, Mn

LOCATION-OWNERSHIP

County	Lincoln.	General location	About 4 km southwest of Pioche.
Mining district	Pioche.	Meridian	Mount Diablo.
Elevation	1,780 m.	Tract	Sec. 33, T 1 N, R 67 E.
Topography	Gentle.	Latitude	37°54′04″ N.
Domain	Mixed.	Longitude	114°28′23″ W.
Owner	Prince Consolidated Mining Co., Pioche, NV (1983).		

GEOLOGY

Type of ore body	Replacement, fissure vein.	Host formation	Lyndon Limestone.
Origin	Hydrothermal.	Geologic age	Middle Cambrian.
Shape of ore body	Tabular.	Rock relationships	Limestone, encloses ore, ore in fractures. Shale, lies under ore, lies along ore. Quartzite, lies under ore, lies along ore.
Ore controls	Bedding, faulting.		
Strike and dip of mineralized zone.	N 20° W: 15° E.		
Mineralized zone average dimensions, m:			
Length	380.	Size	Medium.
Width	Unknown.		
Thickness	13.		
Mineral names	Cerussite, anglesite, hemimorphite, braunite, pyrolusite, goethite, limonite, hematite.		

DEVELOPMENT

Current status	Inactive-past producer	Distance to water supply	<3 km.
Type of operation	Underground-glory hole.	Road requirement	None.
		Distance to power supply	On-site.
Year of discovery	1869.	Mill location	No mill.
Discovery method	Ore mineral in place.		
Initial production	1870.		
Last production	1949.		
Past production	1,112,000 t ore averaging 102.8 g/t Ag; 1.03 g/t Au; 3% Pb; 4% Zn; and 12% Mn (*724*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.[1]

REFERENCES

216, 274, 322, 333, 720, 721, 724, 791.

USGS quad maps	Caliente, 1:250,000. Pioche, 7.5′.
USBM sequence number	0320170023.
USGS MRDS number	D000023.

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[1] Much oxidized ore is reported as remaining; however, no published estimate is available.

PUMPKIN HOLLOW—IRON

Alternate names: Lyon Copper-Iron Deposits, Lyon Claims
Ore body names: Northwest Deposit, North Deposit, South Deposit, East Deposit, E-2 Deposit

Commodities: Fe, Cu, Au, Ag

LOCATION-OWNERSHIP

County	Lyon.
Mining district	Unorganized.
Elevation	1,428 m.
Topography	Hilly.
Domain	Mixed.
Owner	U.S. Steel Corp., Pittsburgh, PA (1984).
Lessee	Plexus Resources Co., Salt Lake City, UT (1984).

General location	About 68 km southeast of Carson City.
Meridian	Mount Diablo.
Tract	Sec. 3, T 12 N, R 26 E.
Latitude	38°56'25" N.
Longitude	119°03'03" W.

GEOLOGY

Type of ore body	Replacement, disseminated.
Origin	Contact metasomatism, hydrothermal.
Shape of ore body	Tabular.
Ore controls	Contact zone, lithology, faulting.
Strike and dip of mineralized zone.	Northeasterly: steeply northwest.
Mineralized zone average dimensions, m:	
Length	853.
Width	610.
Thickness	114.
Depth	107.
Mineral names	Magnetite, pyrite, pyrrhotite, chalcopyrite, actinolite, hedenbergite, diopside, calcite, chlorite, epidote, tremolite, garnet, talc, serpentine, quartz, bornite.

Host formation	Metasedimentary rocks.
Geologic age	Triassic.
Rock relationships	Limestone, replaced by ore. Shale, replaced by ore. Chert, replaced by ore. Skarn (tactite), is ore, gangue. Marble, replaced by ore, gangue.
Size	Large.

DEVELOPMENT

Current status	Inactive-explored.
Type of operation	Prospect.
Year of discovery	1960.
Discovery method	Geophysical anomaly.
Past production	None.

Distance to water supply	>10 km.
Road requirement	<10 km.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	250,000,000 long tons	40% Fe, 0.3% Cu	1969	771

REFERENCES

360, 453, 454, 668, 695, 771.

USGS quad maps	Walker Lake, 1:250,000. Yerington, 15'.
USBM sequence number	0320190181.
USGS MRDS number	W016414.

Comments: The Pumpkin Hollow deposits contain 6 discrete ore bodies.

QUEEN LODE—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.	General location	About 67 km southeast of Battle Mountain.
Mining district	Bootstrap.		
Elevation	1,860 m.	Meridian	Mount Diablo.
Topography	Hilly.	Tract	Sec. 27, T 37 N, R 49 E.
Domain	Private.	Latitude	41°03'19" N.
		Longitude	116°25'50".

Owner	NL Baroid-NL Industries, Inc., Houston, TX (1986).
Operator	Tom Norris Construction (mining contractor), Battle Mountain, NV (1984).

GEOLOGY

Type of ore body	Sedimentary.	Host formation	Vinini.
Origin	Sedimentation, hydrothermal (submarine hot springs).	Geologic age	Ordovician.
		Rock relationships	Chert, encloses ore, gangue. Siltstone, encloses ore, gangue. Shale, encloses ore, gangue. Conglomerate, encloses ore, gangue.
Shape of ore body	Tabular, massive, irregular.		
Ore controls	Bedding.		
Strike and dip of mineralized zone.	N 30° E: 65° N.	Size	Medium.
Mineralized zone average dimensions, m:			
Length	300.		
Width	90.		
Thickness	6.		
Depth	0.		
Mineral names	Barite.		

DEVELOPMENT

Current status	Inactive-past producer (standby).	Distance to water supply	On-site.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit.	Distance to power supply	Mine—on-site generation. Mill—on-site commercial supply.
Year of discovery	1938.	Mill location	Dunphy Siding, 48 km south of mine.
Discovery method	Ore mineral in place.	Mill status	Standby.
		Milling method	Flotation, grinding.
Initial production	1976.	Product type	Fine ground barite.
Last production	1982.	Destination	Alaska, West Coast, and intermountain markets.
Past production	Confidential proprietary data.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

77, 95, 123, 226, 278, 392, 546, 669, 688, 775, 778, 796.

USGS quad maps	McDermitt, 1:250,000. Santa Renia Fields, 7.5'.
USBM sequence number	0320070364.
Mid number	2601148.

Comments: The Queen Lode is mined in conjunction with the Rossi (Sage Hen).

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RAIN—GOLD

Ore body names: Main, Southeast Extension

Commodities: Au, Ag
(Au-Ag ratio = 10–20:1)

LOCATION-OWNERSHIP

County	Elko.
Mining district	Carlin.
Elevation	2,070 m.
Topography	Hilly.
Domain	Possibly private.

General location	About 14 km southeast of Carlin.
Meridian	Mount Diablo.
Tract	Sec. 3, T 31 N, R 53 E. Sec. 33, T 32 N, R 53 E.
Latitude	40°36′35″ N.
Longitude	116°00′25″ W.

Owner	Newmont Mining Corp., New York, NY (1985).
Operator	Carlin Gold Mining Co., Carlin, NV (subsidiary of Newmont Mining Corp.) (1985).

GEOLOGY

Type of ore body	Epithermal, disseminated, sediment-hosted.
Origin	Hydrothermal, epithermal.
Shape of ore body	West-northwest elongate manto.
Ore controls	Faulting, fracturing, lithology (minor).
Strike and dip of mineralized zone.	N 30° to 40° W: dip southwest
Mineralized zone average dimensions, m:	
Length	About 730.
Thickness	110 (maximum).
Depth	46.
Mineral names	Gold, quartz, barite, limonite, manganese oxides, hematite, jarosite, calcite, illite, kaolinite.

Host formation	Webb.
Geologic age	Mississippian.
Rock relationships	Jasperoid breccia, contains ore. Siltstone and breccia, contains ore. Sandstones, contains ore. Shales, contains ore.
Alteration	Silicification, oxidation, argillization, baritization, bleaching.
Size	Small.

DEVELOPMENT

Current status	Active-exploration, feasibility, standby.
Type of operation	Surface
Mining method	Proposed open pit.
Year of discovery	1980.
Discovery method	Geochemical-rock chip sample, drilling.
Initial production	Pending development; possibly 1990's.
Past production	None.

Mill location	Likely will be co-located with mine.
Mill status	No mill.
Milling method	Cyanide heap leach probable.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	8,300,000 tons	0.083 tr oz/ton Au (ore in-place)	1983	511
Above contains	3,400,000 tons	0.147 tr oz/ton Au	1983	511

REFERENCES

27, 59, 61, 90, 118, 224, 226, 319, 350, 363, 511, 581, 663, 664, 665, 669.

USGS quad maps	Winnemucca, 1:250,000. Dixie Flats, 15′.
USBM sequence number	0320070271.

Comments: Development of the Rain deposit is expected to recommence after Gold Quarry goes into production. Further drilling may disclose greater reserves as the ore body is reportedly open at depth and to the east. Ore is in fractures and occurs in the axis of a regional north-northwest plunging antiform. At Rain, the antiform is marked by a high-angle reverse fault trending west-northwest and dipping steeply southwest.

RAINBOW—FLUORINE

Alternate names: Bruno Prospect, Fluorspar Corp. of America, Hope

Commodities: CaF_2

LOCATION-OWNERSHIP

County	Nye.	General location	About 117 km west of Pioche.
Mining district	Quinn Canyon Range.	Meridian	Mount Diablo.
Elevation	2,042 m.	Tract	Sec. 1, T 2 N, R 54 E.
Topography	Hilly.	Latitude	30°03'47" N.
Domain	BLM administered.	Longitude	115°51'17" W.

Owner	Wesley Koyen, Alamo, NV (Rainbow and Emerald Claims); Ed Slavin, Tonopah, NV (Bruno Claims) (1981).

GEOLOGY

Type of ore body	Fissure vein.	Host formation	Volcanic rocks undivided.
Origin	Hydrothermal.	Geologic age	Tertiary.
Shape of ore body	Lenticular.	Rock relationships	Tuff, ore in fractures. Rhyolite, ore in fractures. Dacite, ore in fractures. Latite.
Ore controls	Faulting, igneous.	Size	Small.
Strike and dip of mineralized zone.	N 20° E: 40° W.		
Mineralized zone average dimensions, m:			
Length	2,414.		
Width	805.		
Thickness	30.		
Mineral names	Fluorite, quartz.		

DEVELOPMENT

Current status	Inactive-past producer.	Road requirement	<10 km.
Type of operation	Surface.	Distance to power supply	<50 km.
Mining method	Surface open stope.		
Year of discovery	1941.		
Discovery method	Ore mineral in place.		
Initial production	1945.		
Last production	1946.		
Past production	181 t (*545*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

281, 283, 357, 368, 545, 604, 733, 815, 816.

USGS quad maps	Lund, 1:250,000.
USBM sequence number	0320230200.

RELIEF CANYON—GOLD

Alternate names: (site of) Emerald Spar Fluorite deposit

Commodities: Au, Ag, CaF$_2$ (nonrecoverable)

LOCATION-OWNERSHIP

County	Pershing.
Mining district	Relief-Antelope Springs.
Elevation	1,645 m.
Topography	Rugged.
Domain	Mixed, Federal, private lease.
General location	About 24 km east of Lovelock.
Meridian	Mount Diablo.
Tract	Sec. 16, T 27 N, R 34 E.
Latitude	40°12'15" N.
Longitude	118°10'13" W.
Owner-operator	Lacana Mining Corp., Toronto, ON, Canada (1985). (The development of the property is a joint venture; Lacana's partner is unknown.)

GEOLOGY

Type of ore body	Disseminated epithermal gold, stratabound.
Origin	Hydrothermal.
Shape of ore body	Irregular triangular wedge or bell-shape in plan.
Ore controls	Faulting, lithology.
Age of mineralization	Unknown, possibly from Late Cretaceous to Late Tertiary.
Mineralized zone average dimensions, m:	
Length	730.
Width	550.
Thickness	0 to >30. (deposit open to the southwest)
Mineral names	Native gold or electrum, quartz, pyrite, sericite, hematite, fluorspar, jasperoid, clay.
Host formations	Grass Valley. Natchez Pass (Cane Springs).
Geologic age	Late Triassic.
Rock relationships	Argillite, quartzite, siltstone, shale (Grass Valley), adjacent and above principal ore zone. Jasperoid breccia zone, contains ore. Carbonaceous dolomitic limestone, minor shale and siltstone (Natchez Pass), adjacent and below principal ore zone.
Alteration	Jasperoid silicification, argillic, iron staining, intense oxidation.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Conventional open pit; mine 4,500 t/d ore, and about 6,400 t/d waste.
Year of discovery	1979–82.
Discovery method	Mapping, stream sediment sampling, drilling by Duval Corp.
Initial production	September-October 1984.
Past production	None.
Annual production rate	762 kg (24,500 tr oz) Au.
Distance to water supply	<5 km.
Road requirement	<5 km.
Distance to power supply	<5 km.
Mill location	On-site.
Mill status	Active.
Milling method	Agglomeration, sodium cyanide heap leach, carbon column recovery.
Process rate	About 4,500 t/d.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	7,000,000 tons	0.042 tr oz/ton Au	1983	530
2.. Do[1]	8,000,000 tons	0.04 tr oz/ton Au (diluted ore; stripping ratio = 1.5:1).	1983	199
3.. Do[2]	9,000,000 tons	0.032 tr oz/ton Au (stripping ratio = 2:1)	1984	658

REFERENCES

90, 199, 224, 329, 331, 496, 525, 530, 658, 662, 755, 810.

USGS quad maps	Lovelock, 1:250,000. Buffalo Mountain, 15'.
USBM sequence number	0320270720.

Comments: Gold is in and near jasperoid silicification principally within a sedimentary breccia at the contact between the above 2 host formations.

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[1] Resource is referred to as preliminary pit plan diluted reserves.

[2] Resource is referred to as minable reserves.

RIDGE 7129—ZINC

Alternate names: Gibellini, Bisoni Properties

Commodities: Zn, V, Mo, Se, oil shale

LOCATION-OWNERSHIP

County	Eureka.	General location	About 37 km southwest of Eureka.
Mining district	Fish Creek.	Meridian	Mount Diablo.
Elevation	2,164 m.	Tract	Sec. 3, T 15 N, R 52 E.
Topography	Hilly.	Latitude	39°12'30" N.
Domain	Unknown.	Longitude	116°05'34" W.

Owner	Maynard and Lester Bisoni; Noranda Exploration, Inc., Lakewood CO (1979).

GEOLOGY

Type of ore body	Sedimentary.	Host formation	Woodruff.
Origin	Sedimentation, oxidation.	Geologic age	Devonian.
Shape of ore body	Irregular.	Rock relationships	Mudstone, encloses ore. Siltstone, encloses ore. Chert, near ore.
Ore controls	Lithology.		
Mineralized zone average dimensions, m:		Size	Medium.
Length	>600.		
Width	300.		
Thickness	60.		
Depth	Surface.		
Mineral names	Sphalerite, metahewettite, molybdenite, kerogen.		

DEVELOPMENT

Current status	Inactive-explored.	Distance to water supply	Unknown.
Type of operation	Possible underground.	Road requirement	<10 km.
		Distance to power supply	<50 km.
Year of discovery	Unknown.	Mill location	No mill.
Discovery method	Drilling, trenching.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

112, 333, 593.

USGS quad maps	Millett, 1:250,000. Cockalorum Wash, 15'.
USBM sequence number	0320110222.

Comments: Assay results:

	Unoxidized rock, ppm	*Oxidized rock,* ppm
V	3,000– 7,000	6,000–8,000
Zn	4,000–18,000	30– 100
Se	30– 200	200– 400
Mo	70– 960	30– 80

Fresh black rock yielded as much as 12 gal/ton (50 L/t) syncrude oil (*112*).

ROBINSON DISTRICT—COPPER

Includes: New Ruth Pit, Ruth-Kimberly, Veteran-Tripp Open Pit, Veteran-Tripp Underground, Veteran-Tripp Lo-Grade	Commodities: Cu, Mo, Ag, Au, platinum group metals

LOCATION-OWNERSHIP

County	White Pine.	General location	About 10 km west of Ely.
Mining district	Robinson.	Meridian	Mount Diablo.
Elevation	1,920 to 2,320 m.	Tract	T 16 N, R 62–63 E.
Topography	Hilly.	Latitude	39°15'20" N.
Domain	Private.	Longitude	114°57'59" W.
Owner-operator	Kennecott Copper Corp., Salt Lake City, UT (1984).		

GEOLOGY

Type of ore body	Disseminated, replacement, vein supergene, stockwork.	Host formation	Various (18 formations).
		Geologic age	Ordovician-Tertiary.
Origin	Hydrothermal, oxidation, replacement.	Rock relationships	Various sedimentary, encloses ore, replaced by ore. Quartz monzonite, encloses ore, is ore. Metamorphosed and/or altered sedimentary, encloses ore, is ore.
Shape of ore body	Irregular, massive.		
Ore controls	Igneous, fracturing, lithology.		
District dimensions:			
Length	19 km.		
Width	14 km.		
Depth	0 to 500 m.	Size	Large.
Mineral names	Chalcopyrite, bornite, molybdenite, argentite, pyrite, chalcocite, cerussite, calcite, fluorite, pyrolusite, braunite, hemimorphite, smithsonite, native gold, scheelite, hematite, jarosite, malachite, azurite, cuprite, native copper, chalcanthite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	On-site.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit, underground.	Distance to power supply	On-site.
		Mill location	McGill, 32 km.
Year of discovery	1867.	Mill status	Inactive.
Discovery method	Ore mineral in place.	Milling method	Flotation.
		Process rate	19,972 t/d.
Initial production	1870.		
Last production	1978.		
Past production	Greater than 204 million t ore.		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.[1]

REFERENCES

1, 17, 37, 38, 39, 127, 264, 280, 284, 293, 294, 321, 341, 374, 419, 432, 438, 556, 674, 792, 806, 819, 820, 821, 825, 826.	USGS quad maps	Ely, 1:250,000. Ruth, 7.5'.

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[1] In 1976, Kennecott Copper Corp. reported that 454,000 t of copper could be recovered from 82,554,000 t ore averaging 0.67% Cu (792).

ROCHESTER—SILVER

Alternate names: Silver State, Nenzel Hill

Commodites: Ag, Au

LOCATION-OWNERSHIP

County	Pershing.	General location	About 30 km northeast of Lovelock.
Mining district	Rochester.	Meridian	Mount Diablo.
Elevation	1,829 m.	Tract	Sec. 15, 16, 21, 22, T 28 N, R 34 E.
Topography	Hilly, rugged.	Latitude	40°17′23″ N.
Domain	Mixed; private, BLM administered (4 patented claims and 20 unpatented lode claims).	Longitude	118°12′00″ W.

Owner	Royal Apex Silver, Inc., Wallace, ID (Coeur d'Alene Mines Corp. owns 49.8% of Royal Apex) (1983).
Operator	Coeur d'Alene Mines Corp., Wallace, ID, lessee (acquired 85% of net operating property); ASARCO, Inc., New York, NY, holds a small royalty interest (1985).

GEOLOGY

Type of ore body	Disseminated, stockwork.	Host formation	Koipato Group (Weaver, Rochester, Limerick Formations).
Origin	Hydrothermal.		
Shape of ore body	Tabular, irregular.	Geologic age	Permian-Triassic.
Ore controls	Faults, fractures.	Rock relationships	Rhyolite ash-flow tuffs, volcaniclastics, contains veins and disseminated silver (Weaver Formation). Rhyolite flows and tuffs, contains veins and disseminated silver (Rochester Formation).
Strike of mineralized zone.	Northeast.		
Age of mineralization	Late Cretaceous (70 to 80 million yr).		
Mineralized zone average dimensions, m:			
Length	1,150		
Width	750.	Alteration	Silicification, pyritization, sericitic, oxidation.
Thickness	0 to >200.		
Depth	0.	Size	Medium.
Mineral names	Argentian tetrahedrite, chlorargyrite, silver, acanthite, sphalerite, arsenopyrite, chalcopyrite, electrum, pyrite (95% of sulfides), quartz, sericite (numerous others).		

DEVELOPMENT

Current status	Active-past producer, feasibility.	Distance to water supply	Unavailable.
Type of operation	Possible surface.	Road requirement	Unavailable.
Mining method	Possible open pit.	Distance to power supply	Unavailable.

Year of discovery	1912 (high-grade silver ore).
Initial production	1912.
Last production	1951.
Past production	District— >2,595 kg Au; 276,000 kg Ag; 12.7 t Cu; 152 t Pb; 30 t Zn (*329*).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Probable	70,000,000 tons	1.39 tr oz/ton Ag; 0.0072 tr oz/ton Au	1980	159
Possible	30,000,000 tons			
2..Not reported in reference	75,000,000 tons	1.5 tr oz/ton Ag	1981	61
3.. Do	>100,000,000 tons	1 to 2 tr oz/ton Ag; "small amounts of Au"	1981	745
4..Indicated	88,300,000 tons	1.5 tr oz/ton Ag; 0.007 tr oz/ton Au	1983	94

REFERENCES

61, 74, 93, 94, 159, 323, 329, 362, 613, 662, 745, 746, 756, 776, 777.

USGS quad maps	Lovelock, 1:250,000. Unionville, 15′.
USBM sequence number	0320270675.

Comments: Coeur d'Alene Mines Corp. purchased ASARCO's interest in the property in 1983. Mineral zone dimensions represent disseminated silver grade higher than 34 g/t (>1 oz/ton). From 1969–82, ASARCO reportedly spent $2.9 million in exploration costs on the property. Work in 1984 included large-scale leach testing and about 1,800 m of core drilling. In 1984, the drilling season expanded total mineralized material to 102.1 million t.

ROSSI—BARITE

Alternate names: Sage Hen, Dunphy, National Lead Co.

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.	General location	About 66 km southeast of Battle Mountain.
Mining district	Bootstrap.	Meridian	Mount Diablo.
Elevation	1,770 m.	Tract	Sec. 22, T 37 N, R 49 E.
Topography	Hilly.	Latitude	41°04′03″ N.
Domain	Mixed; private and BLM administered public lands.	Longitude	116°25′31″ W.

Owner	NL Baroid-NL Industries, Inc., Houston, TX (1983).
Operator	Tom Norris Construction (mining contractor), Battle Mountain, NV (1983).

GEOLOGY

Type of ore body	Sedimentary.	Host formation	Vinini.
Origin	Sedimentation, hydrothermal (submarine hot springs).	Geologic age	Ordovician.
Shape of ore body	Tabular, massive, irregular.	Rock relationships	Chert, encloses ore, gangue. Shale, near ore, gangue. Quartzite, near ore. Limestone, near ore.
Ore controls	Bedding.		
Strike and dip of mineralized zone	N 55° E: 60° N.	Size	Large.
Mineralized zone average dimensions, m:			
Length	1,800.		
Width	Unknown.		
Thickness	10.		
Depth	0.		
Mineral names	Barite, chert, witherite.		

DEVELOPMENT

Current status	Inactive-past producer (standby).	Distance to water supply	On-site.
Type of operation	Surface.	Road requirement	None.
Mining method	Open pit.	Distance to power supply	Mine—on-site generator. Mill—on-site commercial supply.
Year of discovery	1937.	Mill location	Dunphy Siding, 48 km south of mine.
Discovery method	Ore mineral in place.	Mill status	Standby.
Initial production	1947.	Milling method	Jigging, flotation, grinding.
Last production	1982.	Product type	Finely ground barite.
Past production	Confidential proprietary data.	Destination	Alaska, West Coast, and intermountain markets.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

71, 87, 95, 123, 226, 278, 392, 449, 546, 669, 688, 775, 778, 796.

USGS quad maps	McDermitt, 1:250,000. Santa Renia Fields, 7.5′.
USBM sequence number	0320070094.
Mid number	2600397.

Comments: The Rossi (Sage Hen) is mined in conjunction with the Queen Lode.

ROUND MOUNTAIN—GOLD

Alternate names: Smoky Valley Mine, Round Mountain Common Operation
Related names: Sunnyside Pit, Southeast Pit

Commodities: Au, Ag
(Au-Ag ratio ≈ 1:2)

LOCATION-OWNERSHIP

County	Nye.
Mining district	Round Mountain (Jefferson Canyon).
Elevation	1,920 m.
Topography	Hilly.
Domain	Mixed; private and BLM administered.

General location	About 80 km north of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 19, T 10 N, R 44 E.
Latitude	38°42′30″ N.
Longitude	117°05′00″ W.

Owner	Louisiana Land and Exploration Co. (LL & E), Lakewood, CO, 50%; Felmont Oil, New York, NY, 25%; Case, Pomeroy and Co., 25% (1984). (Echo Bay Mines Ltd., Edmonton, AB, Canada, bought LL & E's 50% interest subject to completion of definitive agreement, expected in January 1985.)
Operator	Smoky Valley Mining Division of Copper Range Co. (subsidiary of LL & E) (1984).

GEOLOGY

Type of ore body	Disseminated, fissure vein, stockwork.
Origin	Hydrothermal, oxidation.
Shape of ore body	Unknown.
Ore controls	Fracturing, lithology.
Strike and dip of mineralized zone.	Northwest: southwest.
Age of mineralization	Miocene (25 million yr).
Mineralized area dimensions (excluding outlying placer areas), m:	
Length	1,800.
Width	1,200.
Thickness	>750.

(Disseminated zone is about 600 m wide and 1,700 m long.)

Mineral names Electrum, auriferous pyrite, free gold, pyrite, limonite, adularia, quartz, fluorite, realgar, alunite, calcite.

Principal host formation	Tertiary Volcanics (Jefferson Caldera).
Geologic age	Oligocene.
Rock relationships	Quaternary gravel, is ore (resource unknown). Densely welded rhyolite ignimbrite, is ore, in veins and stockwork. Poorly welded rhyolite ignimbrite, is ore, disseminated (contains largest ore reserves). Lithic tuff, is ore in veins. Shale, slate, quartzite (Ordovician), is ore in veins. Granite (Cretaceous Shoshone), is ore in veins.
Alteration	Sericitic, propylitic, argillic, silicification, oxidation.
Size	Large.

DEVELOPMENT

Current status	Active-producer, expansion feasibility.
Type of operation	Surface.
Mining method	Open pit; with 1983 production rate of 9,000 t/d ore, 23,000 t/d waste.
Year of discovery	1901 (district lode gold); 1906 placer gold); 1979 (LL & E).
Discovery method	Ore mineral in place, drilling.
Initial production	1906; again in 1976 (LL & E).
Past production	16,700 kg Au (district) (1901–59) (*422*). 7,493.6 kg Au and 3,940.2 kg Ag (1977–81) (*422*). 2,256.9 kg Au (1982). 2,900 kg Au, 1,700 kg Ag (1983). 3,100 kg Au planned (1984) (*670*).

Distance to water supply	13.7 km to stream from Jett Canyon.
Road requirement	About 1 km.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	Active.
Milling method	Cyanide heap leach, carbon adsorption, electrowinning, smelting.
Pad process rate	48-d cycle, 9,000 t/d.
Product type	Dore bullion (2/3 Au, 1/3 Ag).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	11,617,000 tons	0.061 tr oz/ton Au, 0.07 tr oz/ton Ag (original reserves, cutoff grade 0.02 tr oz Au).	1974	412
2..Proven and probable	195,400,000 tons	0.043 tr oz/ton Au, 0.023 tr oz/ton Ag (114,400,000 tons proven and 81,000,000 tons probable (undiluted).	1981	388
3..Indicated	228,300,000 tons	0.03715 tr oz/ton Au	1983	169

REFERENCES

46, 61, 83, 84, 90, 169, 187, 193, 195, 196, 301, 303, 312, 357, 368, 378, 387, 388, 404, 408, 412, 416, 422, 431, 447, 492, 550, 616, 620, 621, 622, 670, 767, 795, 840.

USGS quad maps	Tonopah, 1:250,000. Round Mountain, 7.5′.
USBM sequence number	0320230149.
USGS MRDS number	W001574.
Mid number	2600594.

Comments: A 36,000-t/d (40,000-ton/d) mill to attain 90% recovery of reserves is under study. Reserves reported in 1983 delineated from 1977 through 1982. This reserve includes production in the intervening years.

RUBY HILL—ZINC

Alternate names: Fad Shaft, Eureka Corporation Mine, Look Out Mine, Locan Shaft

Commodities: Zn, Au, Ag, Pb

LOCATION-OWNERSHIP

County	Eureka.	General location	About 2 km west of Eureka.
Mining district	Eureka.	Meridian	Mount Diablo.
Elevation	2,100 m.	Tract	Sec. 22, T 19 N, R 53 E.
Topography	Hilly.	Latitude	39°30'21" N.
Domain	Mixed; private and BLM administered.	Longitude	115°59'02" W.

Owner	Richmond-Eureka Corp., Miami Beach, FL, 75%; Silver Eureka Corp., Toronto, ON, Canada, 25% (1985). (Sharon Steel Corp., Miami Beach, FL, owns 82% of Richmond-Eureka Corp.)

GEOLOGY

Type of ore body	Replacement, breccia fill.	Host formation	Eldorado Dolomite.
Origin	Hydrothermal.	Geologic age	Mid-Cambrian.
Shape of ore body	Irregular, pipelike.	Rock relationships	Limestone, encloses ore, replaced by ore. Dolomite, lies under ore.
Ore controls	Faulting, fracturing, lithology.		
Strike and dip of mineralized zone.	N 40° W: 60° NE (Ruby Hill Fault); N 90° E: 01° W (trend of deep sulfides).	Alteration	Intense pyritic alteration.
		Size	Medium.
Mineralized zone average dimensions, m:			
Length	600.		
Width	370.		
Thickness	<245.		
Depth	730.		

Mineral names .... Pyrite, sphalerite, galena, smithsonite, cerrusite, arsenopyrite, argentite, gold. (Gold is present in pyrite and arsenopyrite; silver is contained in solid solution with galena.)

DEVELOPMENT

Current status	Inactive-standby; partially developed.	Distance to water supply	On-site.
Type of operation	Underground.	Road requirement	Existing paved road.
Mining method	Cut and fill.	Distance to power supply	<5 km to on-site substation.
Year of discovery	Late 1930's (deep sulfide ore body).	Mill location	On-site (building and infrastructure).
Discovery method	Diamond drilling.	Mill status	Equipment removed.
Initial production	1866 (Eureka district).		
Last production	1964 (estimated).		
Past production	None from deep sulfide deposit.		

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..**Indicated**	3,132,000 tons	0.16 tr oz/ton Au; 5.65 tr oz/ton Ag; 3.7% Pb; 8.3% Zn.	1982	168

REFERENCES

50, 84, 105, 152, 168, 238, 255, 256, 257, 261, 326, 389, 450, 451, 518, 519, 520, 521, 593, 697, 722, 741.

USGS quad maps	Ely, 1:250,000. Eureka, 15'.
USBM sequence number	0320110093.
USGS MRDS number	M030021.
Mid number	2600233.

Comments: There has been no commercial production from the deep sulfide ore body. In 1975, a 245-t sample was taken for metallurgical testing. Excessive water and metallurgical problems have long hampered development of the deposit.

SANTA FE—GOLD

Alternate names: None

Commodities: Au, Ag
(Au-Ag ratio = 1:15)

LOCATION-OWNERSHIP

County	Mineral.
Mining district	Santa Fe.
Elevation	1,490 m.
Topography	Hilly.
Domain	BLM administered.

General location	About 42 km east of Hawthorne.
Meridian	Mount Diablo.
Tract	Sec. 2, T 8 N, R 34 E.
Latitude	38°35′05″ N.
Longitude	118°09′20″ W.

Owner	Westley Mines Ltd., Vancouver, BC, Canada, 82%; Brican Resources Ltd., Vancouver, BC, Canada, 18%; (1984).
Operator	Lacana Mining Corp., Reno, NV (will earn 51% interest by late 1985 if presently held agreement conditions are met) (1984).

GEOLOGY

Type of ore body	Disseminated, epithermal, replacement in breccia fill.
Origin	Hydrothermal.
Shape of ore body	Irregular, pipelike.
Ore controls	Faulting, lithology.
Strike and dip of mineralized zone.	N 30° to 40° W: 75° to 80° NE.
Age of mineralization	Miocene.
Mineralized zone average dimensions, m:	
Length	530 to 1,100.
Width	120.
Thickness	>300.
Mineral names	Gold, silver, pyrite, quartz, jasper, chalcedony, carbonaceous material, sericite, kaolinite, stibnite, hematite, barite, calcite.

Host formations	Guild Mine Member of Mickey Pass Tuff. Pamlico.
Geologic ages	Oliogocene. Triassic.
Rock relationships	Rhyodacite tuff (densely welded), above ore, encloses ore. Limestone (medium-grained), encloses ore, lies along ore, below ore. Jasperoid breccia, is ore.
Alteration	Silicification, carbonitization, sericitic.
Size	Small.

DEVELOPMENT

Current status	Active-feasibility.
Type of operation	Surface.
Mining method	Open pit proposed (300 m long by 60 wide).
Year of discovery	Claims first staked early 1960's.
Annual production rate	590,000 t/a ore anticipated as minimum throughput.

Distance to water supply	Unknown.
Road requirement	0.8 km.
Distance to power supply	Unknown.
Mill location	On-site (planned).
Mill status	Feasibility study—1983.
Milling method	Cyanide heap leach anticipated; small scale, on-site heap leaching was planned for 1984.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	4,360,000 tons	0.082 tr oz/ton Au; 1.22 tr oz/ton Ag	1981	690
2.. Do	5,000,000 tons (oxide)	0.04 tr oz/ton Au; 0.45 tr oz/ton Ag	1984	657
	4,500,000 tons (sulfide)	0.066 tr oz/ton Au; 0.9 tr oz/ton Ag	1984	657
3.. Do	7,000,000 tons (oxide)	0.041 tr oz/ton Au; 0.45 tr oz/ton Ag	1984	786
4.. Do	6,900,000 tons (oxide)	0.048 tr oz/ton Au	1984	531

REFERENCES

86, 130, 196, 463, 503, 523, 531, 598, 650, 657, 690, 786.

USGS quad maps	Walker Lake, 1:250,000. Luning, 7.5′.
USBM sequence number	0320210280.
USGS MRDS number	W016420.

Comments: Gold and silver occur within a pyritic jasperoid replacement of brecciated carbonate and volcanic rocks. By December 1982, drilling had not defined bottom of mineralized pipe. In June 1983, Westley Mines Ltd. was carrying out feasibility studies into the development of an open pit mine using heap leach for metal recovery.

SILVER PEAK—LITHIUM

Alternate names: Clayton Valley

Commodities: Li_2CO_3

LOCATION-OWNERSHIP

County	Esmeralda.	General location	About 49 km southwest of Tonopah.
Mining district	Silver Peak.	Meridian	Mount Diablo.
Elevation	1,300 m.	Tract	Sec. 22, T 2 S, R 39 E.
Topography	Flat.	Latitude	37°45'10" N.
Domain	BLM administered.	Longitude	117°38'20" W.
Owner-operator	Foote Minerals Co., Exton, PA (1985).		

GEOLOGY

Type of ore body	Subsurface brine.	Host formation	Esmeralda.
Origin	Hydrothermal, evaporation.	Geologic age	Tertiary.
Shape of ore body	Tabular.	Rock relationships	Evaporites, encloses brine. Clays, encloses brine. Silts, encloses brine.
Ore controls	Evaporation.		
Mineralized zone average dimensions.	Covers an area of 8,300 ha, up to 460 m thick.	Size	Large.
Mineral names	Hectorite.[1]		

DEVELOPMENT

Current status	Active-producer.	Distance to water supply	On-site.
Type of operation	Wells.	Road requirement	On-site.
Mining method	Solution mining.	Distance to power supply	On-site.
		Mill location	Silver Peak.
Year of discovery	Early 1900's.	Mill status	Operating.
Discovery method	Drilling.	Milling method	Solar evaporation; chemical precipitation.
Initial production	1966.	Process rate	1,200 t/a Li.
Past production	Confidential proprietary data.	Product type	Lithium carbonate.
		Distance shipped	64 km from Silver Peak.
		Destination	Sold f.o.b. bagging plant at Mina, NV.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Possible	386,250,000 t	0.02% Li	1978	345
2..Demonstrated	45,000 tons	Li as Li_2CO_3	1979	638

REFERENCES

8, 32, 109, 117, 146, 345, 369, 370, 371, 535, 542, 543, 544, 595, 614, 638, 677, 747, 748, 804.

USGS quad maps	Goldfield, 1:250,000. Silver Peak, 15'.
USBM sequence number	0320090109.

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[1] Lithium occurs as a constituent in a subsurface saline brine; hectorite may be the source of the brine's lithium content.

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SIXTEEN-TO-ONE—SILVER

Alternate names: None

Commodities: Ag, Au

LOCATION-OWNERSHIP

County	Esmeralda.
Mining district	Red Mountain.
Elevation	2,130 m.
Topography	Rugged, mountainous.
Domain	BLM administered.

General location	About 100 km southwest of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 32, T 2 S, R 38 E.
Latitude	37°42′57″ N.
Longitude	117°47′06″ W.

Owner-operator	Sunshine Mining Co., Dallas, TX, 66–2/3% (1985).
Owner	Mid-Continent Mining Co., Denver, CO, 33–1/3% (1984).

GEOLOGY

Type of ore body	Fissure vein.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting.
Strike and dip of mineralized zone.	N 40° to 70° E: 65° to 90° SE.
Mineralized zone average dimensions, m:	
Length	580.
Thickness	6.7.
Development depth	240.
Mineral names	Argentite-acanthite, proustite, pyrargyrite, marcasite, chalcopyrite, tetrahedrite, native silver (minor), native gold, galena, sphalerite, pyrite, quartz, calcite, barite (minor), siderite (minor).

Host formation	Volcanics.
Geologic age	Miocene.
Rock relationships	Quartz vein, portions are ore. Andesite (tuff flows and tuffaceous sediments), primary host to vein. Rhyolite (tuff, flow breccias), host to vein in uppermost levels.
Alteration	Silicification (footwall), argillic (hanging wall).
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Underground.
Mining method	Sublevel blasthole stoping; 685 t/d ore (1983).
Year of discovery	1935 (first staked).
Discovery method	Ore mineral in place.
Initial production	February 1982.
Past production	19,490.8 kg (626,643 tr oz) Ag; 138.5 kg (4,453 tr oz) Au (1982) (*698*). 28,065.3 kg (902,321 tr oz) Ag; 218.9 kg (7,037 tr oz) Au (1983) (*700*).

Distance to water supply	At millsite, 400-m well.
Road requirement	14-km road improvement.
Distance to power supply	8 to 14 km, 24.6 kV.
Mill location	5.6 km east of mine.
Mill status	Active.
Milling method	Cyanide leach tank, CCD, zinc dust precipitation.
Process rate	635 t/d (700 ton/d).
Product type	20- to 30-kg dore buttons.
Destination	Airlifted to Sunshine's Big Creek Refinery, Kellogg, ID.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference[1]	1,100,000 tons	8.38 tr oz/ton Ag; 0.03 tr oz/ton Au	1982	847
2..Proven and probable	1,077,572 tons	5.4 tr oz/ton Ag; 0.028 tr oz/ton Au	1984	700

REFERENCES

7, 8, 124, 171, 224, 307, 389, 483, 487, 489, 653, 694, 698, 699, 700, 765, 847.

USGS quad maps	Goldfield, 1:250,000. Piper Peak, 15′.
USBM sequence number	0320090134.
Mid number	2601638.

Comments: 1983 metal output recovered from ore averaging 1.65 g/t Au and 187 g/t Ag. 1983 mill output averaged 564 t per operating day. Sunshine's 1983 annual report states the potential for additional reserves is excellent as drilling on the western and downdip extensions of the Sixteen-to-One Vein has intersected mineralization. Sunshine reports the nearby Nivloc Mine, under its control, contains up to 900,000 t of minable ore.

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[1] Reserve is minable reserve; includes 10% dilution of 1 tr oz/ton Ag, 0.01 tr oz/ton Au, and represents reserves above 6,650-ft elevation.

SNOOSE—BARITE

Alternate names: Snoose Creek

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.
Mining district	Snake Mountains.
Elevation	2,100 m.
Topography	Hilly.
Domain	Private.

General location	About 28 km due north of Wells.
Meridian	Mount Diablo.
Tract	Sec. 4, T 40 N, R 62 E.
Latitude	41°23'00" N.
Longitude	114°58'17" W.

Owner	Minerals—Grube Estate, 50%; AZL Resources, Phoenix, AZ, 25%; Superior Oil Co., Sparks, NV, 25%. Surface—Sierra Pacific Power Co., Reno, NV (1983).
Operator	Chromalloy American Corp., St. Louis, MO (1983).

GEOLOGY

Type of ore body	Sedimentary.
Origin	Sedimentation, hydrothermal.
Shape of ore body	Massive, tabular.
Ore controls	Bedding.
Strike and dip of mineralized zone.	N 30° W: 35° E.
Mineralized zone average dimensions, m:	
Length	335.
Width	130.
Thickness	14.
Depth	0.
Mineral names	Barite.

Host formation	Valmy.
Geologic age	Ordovician.
Rock relationships	Greenstone, lies over ore. Siltstone, encloses ore. Chert, near ore. Limestone, encloses ore. Shale, encloses ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer (standby).
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1978.
Discovery method	Ore mineral in place.
Initial production	1978.
Last production	1982.
Past production	Confidential proprietary data.

Distance to water supply	Millsite.
Road requirement	None.
Distance to power supply	Mill on-site generation.
Mill location	34 km northeast of mine.
Mill status	Standby.
Milling method	Crushing, screening, jigging.
Mill feed capacity	565 t/d.
Product type	Unground barite concentrate.
Distance shipped	56 km to Wells, NV, by truck; then 2,350 km to Cyril, OK, by rail.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

77, 95, 123, 226, 278, 449, 546, 669, 716, 775, 778.

USGS quad maps	Wells, 1:250,000. Loomis Mountain, 7.5'.
USBM sequence number	0320070856.
Mid number	2601759.

SPRINGER—TUNGSTEN

Alternate names: Nevada-Massachusetts, Sutton, Stank Mine, Humboldt Mine, Uncle Sam, Summit Mine, Mill City, Humboldt-Springer, Tungsten

Commodities: W, Mo

LOCATION-OWNERSHIP

County	Pershing.
Mining district	Mill City.
Elevation	1,493 m.
Topography	Hilly.
Domain	Mixed; private and BLM administered.

General location	About 13 km north of Imlay.
Meridian	Mount Diablo.
Tract	Sec. 35, T 34 N, R 34 E.
Latitude	40°46'53" N.
Longitude	118°07'56" W.

Owner	General Electric Corp., Fairfield, CT, 80%; Broken Hills Proprietary, Ltd., Melbourne, Australia, 20% (1983).
Operator	Utah International, Inc., San Francisco, CA (a wholly owned subsidiary of Broken Hills Proprietary, Ltd.) (1983).

GEOLOGY

Type of ore body	Replacement, fissure vein.
Origin	Contact metasomatic, hydrothermal.
Shape of ore body	Tabular.
Ore controls	Lithology, bedding.
Strike and dip of mineralized zone.	N 20° E: 70° W.
Mineralized zone average dimensions, m:	
Length	1,524.
Width	400.
Thickness	9.6.
Mineral names	Scheelite, molybdenite, chalcopyrite, turquoise, arsenopyrite, stilbite, pyrrhotite, garnet, pyrite.

Host formation	Raspberry.
Geologic age	Upper Triassic.
Rock relationshps	Limestone, replaced by ore, gangue. Hornfels, lies over ore, lies under ore. Slate, lies over ore, lies under ore. Quartzite, lies over ore, lies under ore.
Size	Large.

DEVELOPMENT

Current status	Inactive-developed (standby).
Type of operation	Underground.
Mining method	Shrinkage stope (65%), cut and fill (35%).
Year of discovery	1914.
Discovery method	Ore mineral in place.
Initial production	1982 (from district, 1917).
Last production	Produced for a period in 1982.

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	On standby.
Milling method	Flotation and chemical (APT).
Process rate	907 t/d.
Product type	APT.
Distance shipped	3,496 km by truck.
Destination	Cleveland, OH (G.E.'s Refractory Metals products).

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

206, 259, 260, 263, 314, 329, 342, 343, 352, 376, 421, 478, 608, 685, 715, 739, 774, 830, 846, 848.

USGS quad maps	Lovelock, 1:250,000. Eugene Mountains Area, 15'.
USBM sequence number	0320270048.
USGS MRDS number	M060313.
Mid number	2600964.

STERLING—GOLD

Alternate names: Diamond Queen, Gold Ranch, North Panama, Panama, Abrose Open Pit

Commodities: Au, Ag, Hg, Sb (Au-Ag ratio ≈ 100:1)

LOCATION-OWNERSHIP

County	Nye.
Mining district	Bare Mountain.
Elevation	1,220 m.
Topography	Rugged, mountainous.
Domain	BLM administered.

General location	About 10 km east of Beatty.
Meridian	Mount Diablo.
Tract	Sec. 5, T 13 S, R 48 E (unsurveyed).
Latitude	36°49′50″ N.
Longitude	116°38′25″ W.

Owner-operator	Saga Exploration Co., Winnemucca, NV (1984).
Owner	Geomex Development, Inc., Calgary, AB, Canada, 46.5% (1984).

GEOLOGY

Type of ore body	Disseminated, fault zone, fissure-filling.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore control	Fault (thrust).
Strike and dip of mineralized zone.	North: unknown.
Age of mineralization	13.9 million yr.
Mineralized zone average dimensions, m:	
Length	Undetermined.
Width	Up to 25.
Thickness	Up to 20.
Mineral names	Free gold, kaolinite, halloysite, alunite, limonite, jarosite, calcite, fluorite, stibnite, cerrusite, galena, possible cinnabar and pyrite.

Host formations	Wood Canyon. Bonanza King.
Geologic ages	Possible Precambrian. Cambrian.
Rock relationships	Siltstone (breccia), contains ore (upper plate, Bonanza King). Shale, contains ore (upper plate, Bonanza King). Breccia, common in ore zone. Jasperoid (breccia), near ore, may be ore. Dolomite (breccia), near ore, lies beneath ore.
Alteration	Oxidation, silicification (below ore), kaolinization.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Underground, surface.
Year of discovery	1980 by Cordex exploration.
Discovery method	Unavailable.
Initial production	1980.
Past production	289 kg Au (9,303 tr oz) (1983) (*533*).
Annual production rate	280 to 370 kg Au.

Distance to water supply	Unknown.
Road requirement	Unknown.
Distance to power supply	On-site diesel electric generation.
Mill location	Estimated 1 km east of mine.
Mill status	Active.
Milling method	Cyanide heap leach, carbon column recovery.
Process rate	270 t/d (300 ton/d) projected in 1980 for crusher; crusher rated capacity is 82 t/h (90 ton/h) (see comments).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference[1]	250,000 tons	0.5 tr oz/ton Au	1980	61
2..Proven, probable, possible[2]	200,000 tons	0.20 oz/ton Au	1983	533

REFERENCES

61, 97, 98, 209, 210, 533.

USGS quad maps	Death Valley, 1:250,000. Bare mountain, 15′.
USBM sequence number	0320230486.
Mid number	2601503.

Comments: Garside and Tingley (*210*) report disseminated gold mineralization occurs along thrust fault between upper plate siltstone and lower plate dolomite. The ore occurs mainly in the siltstone of the upper plate. Ore contains up to 0.5% Hg. In 1980, a test heap was planned in May and full-scale leaching was anticipated to commence as early as June or July 1980.

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[1] Garside and Tingley (*210*) report ore below 0.1 tr oz/ton Au not mined. Ore grades are generally 0.5 to 1 tr oz/ton Au, but can be up to 4 tr oz/ton Au.

[2] Additional 7,500 tr oz recoverable gold reported in open pit. Total recoverable gold reserves is an estimated 41,000 tr oz.

STORMY CREEK—BARITE

Alternate names: None

Commodities: $BaSO_4$

LOCATION-OWNERSHIP

County	Elko.
Mining district	Snake Mountains.
Elevation	2,195 m.
Topography	Rugged.
Domain	Private.
Owner[1]	(1983).
Lessee	Old Soldier Minerals, Houston, TX (1983).
Operator	Geowest Services, Inc., Elko, NV (1983).

General location	About 36 km northwest of Wells.
Meridian	Mount Diablo.
Tract	Sec. 27, T 42 N, R 61 E.
Latitude	41°31'24" N.
Longitude	115°11'51" W.

GEOLOGY

Type of ore body	Sedimentary.
Origin	Probably submarine volcanism.
Shape of ore body	Tabular.
Ore controls	Bedding.
Strike and dip of mineralized zone.	N 15° W; nearly flat lying.
Mineralized zone average dimensions, m:	
Length	300.
Width	200.
Thickness	12.
Depth	5.
Mineral names	Barite.

Host formation	Valmy.
Geologic age	Ordovician.
Rock relationships	Limestone, lies over ore. Chert, lies over ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer (standby).
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	Unknown.
Discovery method	Ore mineral in place.
Initial production	1981.
Last production	1982.
Past production	Confidential proprietary data.

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site generation.
Mill location	10.4 km from mine.
Mill status	Standby.
Milling method	Crushing, jigging.
Process rate	908 t/d.
Product type	Crude barite.
Distance shipped	3,000 km to Abbeville, LA; 2,000 km to Elk City, OK.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

87, 205, 226, 330, 392, 546, 548, 612, 669, 688, 716.

USGS quad maps	Wells, 1:250,000. Stormy Peak, 7.5'.
USBM sequence number	0320070882.
Mid number	2601592.

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[1] Ownership is divided among numerous individuals of the Wright and Marble families of Deeth, NV.

SUTHERLAND—ANTIMONY

Alternate names: Reid, Salvation, Kermesite, Thies-Hutchins

Commodities: Sb

LOCATION-OWNERSHIP

County	Pershing.	General location	About 19 km east of Lovelock.
Mining district	Block Knob.	Meridian	Mount Diablo.
Elevation	1,603 m.	Tract	Sec. 15, T 27 N, R 33 E.
Topography	Rugged.	Latitude	40°12'45" N.
Domain	Private.	Longitude	118°15'35" W.
Owner-operator	Saga Exploration Co., Winnemucca, NV (1976).		

GEOLOGY

Type of ore body	Fault fissure.	Host formation	Possible Auld Lang Syne Group.
Origin	Hydrothermal.	Geologic ages	Triassic. Jurassic.
Shape of ore body	Tabular.		
Ore controls	Faulting, fracturing.	Rock relationships	Sandstone, encloses ore. Shale, near ore. Limestone, encloses ore.
Strike and dip of mineralized zone.	Northwest: 80° W to 80° E.		
Mineralized zone average dimensions, m:		Size	Small.
Length	150.		
Width	75.		
Thickness	1.		
Depth	0.		
Mineral names	Stibnite.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	<50 km.
Type of operation	Underground.	Road requirement	None.
		Distance to power supply	<50 km.
Year of discovery	Unknown—prior to 1870.	Mill location	No mill.
Discovery method	Ore mineral in place.		
Initial production	1870.		
Last production	1975.		
Past production	1,542 t Sb metal (*376*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

329, 376, 683, 718.

USGS quad maps	Lovelock, 1:250,000. Lovelock, 15'.
USBM sequence number	0320270355.
USGS MRDS number	M060406.
Mid number	2500544.

Comments: Sutherland Mine is reported to have been the largest antimony producer in Nevada. Most of the production was during World War I.

TAYLOR—SILVER

Associated pit names: Northwest, Northeast, Bishop, Argus

Commodities: Ag, Au

LOCATION-OWNERSHIP

County	White Pine.
Mining district	Taylor.
Elevation	2,290 m.
Topography	Hilly, rugged.
Domain	Mixed; private and National forest.

General location	About 24 km southeast of Ely.
Meridian	Mount Diablo.
Tract	Sec. 16, T 14 N, R 65 E.
Latitude	39°04'40" N.
Longitude	114°40'50" W.

Owner-operator	Silver King Mines, Inc., Salt Lake City, UT, 50% (1984).
Owner	NERCO Minerals Co., Fairbanks, AK, 50% (A subsidiary of Pacific Power and Light Co., Portland, OR) (1984).

GEOLOGY

Type of ore body	Disseminated, breccia fill, replacement.
Origin	Hydrothermal.
Shape of ore body	Tabular, blanketlike.
Ore controls	Fractures, folding, bedding.
Strike and dip of mineralized zone.	N 18° W: 40° E.
Age of mineralization	Cretaceous or Tertiary.
Mineralized zone average dimensions (of central higher deposit), m:	
Length	900.
Width	150.
Thickness	15.
Depth	9.
Mineral names	Argentite, native silver, possible cerargyrite, rare galena, chalcopyrite, tetrahedrite, sphalerite, stibnite, calcite, clay, limonite, rare fluorite.

Host formation	Guilmette (possibly Joana).
Geologic age	Devonian.
Rock relationships	Limestone breccia, encloses ore. Jasperoid limestone, is ore, gangue. Rhyolitic dikes and sills, intrudes ore, contains ore zenoliths.
Alteration	Silicification (jasperiod).
Size	Medium.

DEVELOPMENT

Current status	Active-producer.[1]
Type of operation	Surface.
Mining method	Open pit, benched; ore production about 1,500 t/d; stripping ratio = 1.7:1 (waste:ore).
Year of discovery	1868 (district); early 1960's (present deposit).
Discovery method	Percussion drilling.
Initial production	1965 (by Silver King, underground); May 1981 (open pit).
Past production	District—about 54,000 t ore, 690 g/t Ag (prior to 1885). District—about 91,000 t ore, 340 g/t Ag (1920–60). Taylor underground—3,600 t ore, 1,030 g/t Ag (1964). Taylor Pit—>87,000 kg Ag (1982 to early 1984) (*676*).
Annual production rate	2,600 to 3,300 kg (85,000 to 105,000 tr oz/month).

Distance to water supply	1.8 km to deep wells.
Road requirement	6 km was improved.
Distance to power supply	5-km 69-kV line installed.
Mill location	On-site.
Mill status	Producing.
Milling method	Agitated cyanide leach, CCD, zinc dust precipitation.
Process rate	1,090 t/d (1,200 ton/d).
Product type	Silver precipitate.
Distance shipped	885 km.
Destination	Handy & Harmon, El Monte, CA.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Proven and indicated	10,000,000 tons	3.2 tr oz/ton Ag	1980	636
2..Measured and indicated	7,000,000 tons	3.2 tr oz/ton Ag (cutoff 2 tr oz/ton Ag)	1983	637

REFERENCES

12, 90, 120, 121, 153, 157, 165, 167, 251, 252, 284, 390, 414, 428, 429, 441, 442, 445, 446, 582, 636, 637, 644, 647, 652, 654, 676, 760, 777, 789, 790.

USGS quad maps	Ely, 1:250,000. Conners Pass, 7.5'.
USBM sequence number	0320330465.
Mid number	2601564.

Comments: Mineralized zone—asymmetrical-plunging anticline; orientation of dimensions are gross estimates.

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[1] The Taylor Mine closed after December 31, 1984, because of depressed silver prices.

THREE KIDS—MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

County	Clark.
Mining district	Las Vegas.
Elevation	550 m.
Topography	Hilly.
Domain	Mixed

General location	About 23 km southeast of Las Vegas.
Meridian	Mount Diablo.
Tract	Sec. 35, T 21 S, R 63 E.
Latitude	36°04'50" N.
Longitude	114°47'23" W.

Owner	Sam's Ranch Estate, Inc., Las Vegas, NV (1984).

GEOLOGY

Type of ore body	Sedimentary.
Origin	Hydrothermal, sedimentation.
Shape of ore body	Tabular.
Ore controls	Lithology, faulting.
Strike and dip of mineralized zone.	N 45° E: 30° N.
Mineralized zone average dimension, m:	
Length	417.
Width	396.
Thickness	12.
Depth	39.
Mineral names	Wad, psilomelane, pyrolusite.

Host formation	Muddy Creek.
Geologic age	Pliocene.
Rock relationships	Shale, lies over ore. Evaporite, lies over ore. Gypsiferous sandstone, is ore. Dolomite, lies over ore. Andesite, lies under ore.
Size	Large.

DEVELOPMENT

Current status	Inactive, past producer.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1917.
Discovery method	Ore mineral in place.
Initial production	1917.
Last production	1961.
Past production	2,260,000 t ore averaging 18% Mn yielded nearly 610,000 t of concentrates averaging 35% Mn (*733*).

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill location	Milling facilities have been removed from site.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Demonstrated	7,230,000 t	13.2% Mn	1982	351

REFERENCES

9, 41, 262, 267, 291, 327, 351, 386, 399, 407, 457, 547, 721, 726, 733, 743, 744.

USGS quad maps	Las Vegas, 1:250,000. Henderson, 7.5'.
USBM sequence number	0320030010.
USGS MRDS number	M031085.

TONKIN SPRINGS—GOLD

Alternate names: Rob Claim Group

Commodities: Au

LOCATION-OWNERSHIP

County	Eureka.	**General location**	About 95 km northeast of Eureka.
Mining district	Antelope.	**Meridian**	Mount Diablo.
Elevation	2,130 m.	**Tract**	Sec. 3, T 23-1/2 N, R 49 E.
Topography	Hilly, mountainous.	**Latitude**	39°54′27″ N.
Domain	BLM administered.	**Longitude**	116°26′54″ W.

Owner-operator	Silver State Mine Corp., Denver, CO, 55% (1985).
Owner	Precambrian Exploration, Inc., Lakewood, CO, 45% (1985).

GEOLOGY

Type of ore body	Disseminated, replacement.
Origin	Hydrothermal.
Shape of ore body	Stratiform; irregular in plan.
Ore controls	Northwest-trending fractures, volcanic capping, sill-like intrusive.
Strike and dip of mineralized zone.	Northwest: nearly horizontal.
Age of mineralization	Tertiary.
Mineralized zone average dimensions, m:	
Length	450.
Width	300.
Thickness:	
Zone	85.
Bed	≈5 to ≈25.
Depth	0 to 70.
Mineral names	Pyrite (auriferous), arsenopyrite (auriferous), possible free gold, realgar, orpiment, stibnite, calcite, jasper. (About 75% of the gold is thought to occur in sulfides.)

Host formation	Lower Vinini.
Geologic age	Ordovician.
Rock relationships	Sandy dolomite limestone-jasperoid replacement, contains ore. Black carbonaceous shale, near ore. Calcarenite, jasperoid replacement contains ore (best host). Siltstones, near ore. Chert, near ore. Intrusives (syenite), near ore. Tertiary volcanics, above ore.
Alteration	Silicification (jasperoid development), calcification, carbonization.
Size	Small.

DEVELOPMENT

Current status	Active-exploration.
Type of operation	Would be surface.
Mining method	Would be open pit.
Year of discovery	1981.
Discovery method	Geochemical survey, geological mapping.
Initial production	No production schedule established.
Past production	None.

Distance to water supply	Unknown.
Road requirement	Unknown.
Distance to power supply	Unknown.
Mill status	Feasibility.
Milling method	Would require an autoclave system or some type of pressure chlorination-pressure acidation treatment.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	4,000,000 tons	0.06 tr oz/ton Au	1976	616
2..Indicated	2,500,000 tons	0.09 tr oz/ton Au; Upper Zone, stripping ratio = 2.4:1 (waste:ore).	1983	241
Indicated	500,000 tons	0.09 tr oz/ton Au; Lower Zone, stripping ratio = 14.7:1 (waste:ore).	1983	241

REFERENCES

27, 241, 486, 593, 616.

USGS quad maps	Millett, 1:250,000. Roberts Creek Mountains, 15′.
USBM sequence number	0320110229.

Comments: A northwest-trending set of high-angle normal faults, probably associated with basin and range rifting, is most important of two faulting patterns for mineralization. Gold distribution is homogeneous throughout microfractured rock along strike of mineral trend.

TONOPAH—TUNGSTEN

Alternate names: Moly Tonopah, Jack

Commodities: W, Cu, Mo

LOCATION-OWNERSHIP

County	Humboldt.
Mining district	Potosi.
Elevation	1,743 m.
Topography	Rugged.
Domain	Unknown.
Owner-operator	Unavailable.

General location	About 53 km northeast of Winnemucca.
Meridian	Mount Diablo.
Tract	Sec. 33, T 39 N, R 42 E.
Latitude	41°12'36" N.
Longitude	117°15'26" W.

GEOLOGY

Type of ore body	Replacement, contact metasomatism.
Origin	Sedimentary, igneous intrusion.
Shape of ore body	Undetermined.
Ore controls	Lithology, fracturing, faulting.
Strike and dip of mineralized zone.	North-northeast: east.
Mineralized zone average dimensions, m:	
Length	>907.
Width	Unknown.
Thickness	Up to 4.6.
Depth	Unknown.
Mineral names	Chrysocolla, calcite, epidote, quartz pyrite, chalcopyrite, molybdenite, scheelite, powellite.

Host formation	Preble.
Geologic age	Cambrian.
Rock relationships	Granodiorite, lies along ore. Skarn, is ore. Marble, lies along ore, encloses ore. Hornfels, lies along ore, encloses ore. Limestone, replaced by ore, lies along ore.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer.
Type of operation	Surface, underground.
Mining method	Open pit, overhand stope.
Year of discovery	Before 1950.
Discovery method	Undetermined.
Initial production	1950.
Last production	Unknown.
Past production	19,750 tons ore, averaging 0.3% WO_3 containing 5,925 short ton units[1] WO_3 (*285*).

Distance to water supply	On-site.
Distance to power supply	On-site.
Road requirement	On-site.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

263, 269, 270, 272, 285, 801.

USGS quad maps	McDermitt, 1:250,000. Osgood Mountains, 15'.
USBM sequence number	0320130047.
USGS MRDS number	M030029.

Comments: Property is 183 to 366 m west of South Extension pit of the Getchell gold mine, operated by Getchell Mine, Inc., 1950–55. See references for Getchell Mine for additional information.

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[1] Short ton unit = 20 lb of contained WO_3.

TONOPAH DIVIDE—GOLD

Alternate names: Old Big Divide, Gold Hill, Gold Mountain, Divide

Commodities: Au, Ag

LOCATION-OWNERSHIP

County	Esmeralda.
Mining district	Divide.
Elevation	1,890 m.
Topography	Hilly, mountainous.
Domain	Unknown.

General location	About 10 km south of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 26, T 2 N, R 42 E.
Latitude	37°59′42″ N.
Longitude	117°14′17″ W.

Owner	Tonopah Divide Mining Co., Reno, NV (1984).
Operator	Ebco Enterprises, Tonopah, NV (Parent company is Falcon Explorations Co., Emeryville, CA. A lease-option agreement on the property has been held since 1980.) (1984)

GEOLOGY

Type of ore body	Vein, disseminated in stockwork.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faults, fractures (shear zone).
Strike and dip of mineralized zone.	N 40° W: nearly vertical (main lode).
Age of mineralization	Miocene (16 to 17 million yr).
Mineralized zone average dimensions (size as determined by assay walls) (*361*), m:	
Length	150.
Width	135.
Thickness	6.5.
Depth	0.

Mineral names .... Cerargyrite, "sooty" argentite, molybdenite, powellite, ferrimolydite, sphalerite, chalcopyrite, argentiferous galena, possible tetrahedrite, limonite, sericite, pyrite, adularia, quartz, kaolinite.

Host formations	Volcanics—Fraction Breccia (principal host). Siebert—Oddie Rhyolite.
Geologic age	Tertiary.
Rock relationships	Rhyolitic volcanics, fractures contain ore, gangue. Rhyolitic breccia, fractures contain ore, gangue.
Alteration	Minor silicification, sericitic, chloritic, oxidation, pyritization, potassic, and propylitic zoned around fault zone.
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit; 1981-82 production rate was about 900 t/d ore.
Year of discovery	1902, Au; 1917, Ag (district).
Initial production	About 1912; 1981 by Falcon Exploration Co.
Last production	Closed in July 1982; reported active in 1983-84. Open pit expected to be mined out by end of 1984.
Past production	District total; 101,866 kg (3,275,079 tr oz) Ag; 1,010 kg (32,474 tr oz) Au. Most production from 1920-29 and from Tonopah Divide Mine (*209*).

Distance to water supply	On-site, 154-m well (mill).
Road requirement	Existing.
Distance to power supply	Unknown.
Mill location	10 km southwest of mine in Alkali Flat.
Mill status	Active.
Milling method	Cyanide heap leach, zinc precipitation (Ag), carbon precipitation (Au).
Process rate	907 t/d (1,000 ton/d) (1981); rated crusher capacity of 181 t/h (200 ton/h).

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.[1]

REFERENCES

7, 8, 62, 63, 64, 65, 209, 211, 361, 377, 629, 703.

USGS quad maps	Goldfield, 1:250,000. Mud Lake, 15′.
USBM sequence number	0320090087.
USGS MRDS number	M030063.
Mid number	2601527.

Comments: Original mine life planned in 1981 was 5 yr. The mine plan was to initially mine and truck 70,000 t of mine dumps to the millsite at the approximate rate of 907 t/d. After completion of mining the dumps, mining would commence on the main open pit that contains approximately 1.45 million t ore. Each heap pad contains approximately 360,000 t ore.

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[1] Falcon Exploration 1981 operations plans were to initially mine about 1.5 million t of combined dump material and lode material. Garside and Tingley's field examination report of March 26, 1982 (*211*), states that the average grade is 8.6 g/t (0.25 tr oz/ton) Ag and about 2.7 g/t (0.08 tr oz/ton) Au.

TONOPAH HASBROUCK—GOLD

Alternate names: None

Commodities: Au, Ag

LOCATION-OWNERSHIP

County	Esmeralda.
Mining district	Divide.
Elevation	1,735 m.
Topography	Hilly, mountainous.
Domain	BLM administered, private.

General location	About 8 km southwest of Tonopah.
Meridian	Mount Diablo.
Tract	Sec. 33, T 2 N, R 42 E.
Latitude	37°59'29" N.
Longitude	117°16'09" W.

Owner	Cordex Exploration Co., Reno, NV (1984).

GEOLOGY

Type of ore body	Fissure veins, disseminated.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Faulting, fracturing, lithology.
Age of mineralization	Mid-Miocene (15.5 to 16.5 million yr).
Mineralized zone average dimensions, m:	
Length	>1,500 (workings).
Depth	>90.
Mineral names	Free gold, electrum, argentite, silver halides, pyrite, quartz, sericite.

Host formation	Siebert (Volcanic).
Geologic age	Miocene.
Rock relationships	Rhyolite tuff, contains disseminated Au. Dacite and rhyolite breccia, contains ore. Volcaniclastics, cut by ore veins, below disseminated Au.
Alteration	Argillic, silicification, oxidation; potassic, phyllic, propylitic zones around fractures and faults.
Size	Small.

DEVELOPMENT

Current status	Active-exploration, past producer.
Type of operation	Explored by Cordex for low-grade precious metal open pit.
Year of discovery	1902, Ag discovered in district; 1974, exploration commenced by Cordex Exploration Co.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	5,000,000 tons	0.06 tr oz/ton Au, 1.5 tr oz/ton Ag	1982	611

REFERENCES

7, 8, 62, 63, 64, 65, 209, 211, 224, 361, 377, 381, 611, 629.

USGS quad maps	Goldfield, 1:250,000. Klondike 7.5'.
USBM sequence number	0320090339.

Comments: Sixteen samples taken from silicified sedimentary rocks on Hasbrouck Mountain by the Nevada Bureau of Mines and Geology in the 1970's averaged 2 g/t (0.06 tr oz/ton) Au and 43.2 g/t (1.26 tr oz/ton) Ag (*211*).

VICTORIA—COPPER

Alternate names: Anaconda-Victoria

Commodities: Cu, Ag, Bi

LOCATION-OWNERSHIP

County	Elko.	General location	About 126 km northeast of Ely.
Mining district	Dolly Varden.	Meridian	Mount Diablo.
Elevation	2,316 m.	Tract	Sec. 5, T 28 N, R 66 E.
Topography	Rugged.	Latitude	40°19'45" N.
Domain	Private.	Longitude	114°33'05" W.

Owner-operator	Hecla Mining Co., Wallace, ID (1985).

GEOLOGY

Type of ore body	Skarn-breccia pipe.
Origin	Solution collapse, contact metamorphism.
Shape of ore body	Arcuate in plan.
Ore controls	Fracturing, contact zone.
Dip of mineralized zone.	45°
Age of mineralization	Possibly Cretaceous.
Mineralized zone average dimensions, m:	
Length	100.
Width	175.
Thickness	180.
Mineral names	Chalcopyrite, pyrite, chalcocite, bornite, bismuthinite, quartz, calcite, wittichenite, covellite, chrysocolla, malachite, azurite, native copper (minor), cuprite, Fe-oxides, diopside, calcite.

Host formation	Pequop.
Geologic age	Permian.
Rock relationships	Limestone, encloses ore, breccia contains ore. Dolomite, encloses ore, breccia contains ore. Calcareous sandstone-quartzite, encloses ore, breccia contains ore. Quartz latite porphyry dike, near ore. Porphyritic quartz monzonite, beneath ore.
Alteration	Silicification, argillic, oxidation.
Size	Medium.

DEVELOPMENT

Current status	Inactive-past producer, standby.
Type of operation	Underground.
Mining method	Sublevel block caving.
Year of discovery	1872.
Discovery method	Ore mineral in place.
Initial production	1973-74 (Anaconda).
Last production	1977 (Anaconda); 1981 (Day Mines, Inc.-Hecla Mining Co.).
Past production	Confidential proprietary data.

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill location	On-site.
Mill status	Inactive, standby.
Milling method	Flotation.
Process rate	907 t/d.
Product type	Cu-Ag concentrate.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Proven	1,491,200 tons	2.34% Cu	1977	337
2..Probable	148,383 tons	2.51% Cu	1977	337

REFERENCES

25, 226, 337, 476, 669, 788, 823, 824, 836.

USGS quad maps	Elko, 1:250,000.
USBM sequence number	0320070001.
USGS MRDS number	W002693.
Mid number	2600558.

Comments: See reference 836 for additional reserve-resource data. Anaconda Minerals Co. explored the ore body in the early 1940's. Day Mines, Inc., purchased the property from Anaconda in 1979. Day Mines was purchased by Hecla in 1981. The Victoria ore body is a breccia-fill deposit in the Pequop Limestone Formation near the contact of the Melrose porphyritic quartz monzonite stock of Cretaceous-Jurassic age. Bedded limestone, dolomite, and sandstone sediments of the Pequop surrounding the Victoria ore body have strikes trending from N 34° E to almost due east. Dips range from 0° to 34° S to SW, with an average dip of approximately 20° SW (337).

VIRGIN RIVER—MANGANESE

Alternate names: None

Commodities: Mn

LOCATION-OWNERSHIP

County	Clark.	General location	About 61 km east of Las Vegas.
Mining district	Virgin River.	Meridian	Mount Diablo.
Elevation	439 m.	Tract	Sec. 13, T 20 S, R 67 E.
Topography	Hilly.	Latitude	36°11'40" N.
Domain	National recreation area.	Longitude	114°27'28" W.

Owner	United States (managed by National Park Service) (1985).

GEOLOGY

Type of ore body	Sedimentary.	Host formation	Muddy Creek.
Origin	Hydrothermal, sedimentation.	Geologic age	Pliocene.
Shape of ore body	Tabular.	Rock relationships	Shale, lies over ore. Gypsiferous sandstone, is ore. Basalt, lies over and under ore.[1]
Ore controls	Bedding, lithology.	Size	Large.
Strike and dip of mineralized zone.	N 5° W: 30° E.		
Mineralized zone average dimensions, m:			
Length	1,460.		
Width	260.		
Thickness	7.		
Depth	39.		
Mineral names	Wad.		

DEVELOPMENT

Current status	Inactive-explored.	Distance to water supply	<3 km.
Type of operation	Possible surface.	Road requirement	<50 km.
		Distance to power supply	<50 km.
Year of discovery	1902.	Mill location	No mill.
Discovery method	Ore mineral in place.		
Initial production	No production.		

PUBLISHED RESERVES-RESOURCES[2]

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Measured	14,000 tons	Average: 17% Mn: cutoff: 15% Mn:	1949	407
2.. Do	55,000 tons	Average: 15% Mn; cutoff: 12% Mn	1949	407
3.. Do	134,000 tons	Average: 13% Mn; cutoff: 10% Mn	1949	407
4.. Do	215,000 tons	Average: 12% Mn; cutoff: 8% Mn	1949	407
5.. Do	320,000 tons	Average: 10% Mn; cutoff: 5% Mn	1949	407

REFERENCES

9, 262, 267, 291, 327, 353, 386, 407, 547, 721, 726, 733

USGS quad maps	Las Vegas, 1:250,000. Virgin Basin, 15'.
USBM sequence number	0320030009.
USGS MRDS number	M031088.

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[1] A 4.5-m basalt flow separates 2 manganiferous beds.

[2] Tonnages are cumulative and represent minimum mining width of 0.95 m.

WARD—ZINC-LEAD

Associated ore bodies: Caroline, Good Luck

Commodities: Zn-Pb, Ag, Cu, Au, Mo (Mo—not recoverable, deep seated)

LOCATION-OWNERSHIP

County	White Pine.
Mining district	Ward.
Elevation	2,560 m.
Topography	Rugged.
Domain	BLM administered.

General location	About 13 km south-southwest of Ely.
Meridian	Mount Diablo.
Tract	Sec. 15, T 14 N, R 63 E.
Latitude	39°04′45″ N.
Longitude	114°52′55″ W.

Owner-operator	Silver King Mines, Inc., Salt Lake City, UT (60%); Pacific Silver Corp., Salt Lake City, UT (40%) (1985).
Royalties to	Gulf Oil Corp., Denver, CO (a 2-1/2% net smelter return (NSR) on future production until accruance of $3.5 million); Phillips Petroleum Co., Bartlesville, OK (a 3% NSR).

GEOLOGY

Type of ore body	Replacement.
Origin	Hydrothermal.
Shape of ore body	Tabular, mantos.
Ore controls	Lithology, fracturing.
Strike and dip of mineralized zone.	N 55° W: 20° E.
Age of mineralization	Tertiary.
Mineralized zone average dimensions, m:	
Length	760.
Width	60.
Thickness	14.
Depth	280.
Mineral names	Sphalerite, chalcopyrite, galena, pyrite, covellite, chalcocite, barite, smithsonite, molybdenite, jasperoid.

Host formations	Ely. Joana. Guilmette Limestone.
Geologic ages	Pennsylvanian. Mississippian. Devonian.
Rock relationships	Limestone, gangue. Skarn, replaced by ore. Marble, gangue. Tertiary monzonite stock, sills, dikes, intrudes ore.
Alteration	Carbonization, silicification.
Size	Medium.

DEVELOPMENT

Current status	Active-development.
Type of operation	Underground, access by twin 1,370-m declines.
Mining method	Unknown.
Year of discovery	1968 (deep ore bodies).
Discovery method	Geological inference, drilling.
Initial production	Expected in 1986-87.
Last production	1967 (district).

Distance to water supply	<3 km.
Road requirement	None.
Distance to power supply	<10 km.
Mill location	On-site.
Mill status	Development.
Milling method	Flotation.
Process rate	1,100 t/d (1,200 ton/d) planned. Construction to begin in 1985, completion in late 1986.
Product type	Zn, Cu, Pb concentrates.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference[1]	5,000,000 tons	3 tr oz/ton Ag; 1.4% Cu; 5.5% combined Pb-Zn at North Good Luck portion of deposit.	1983	637
Indicated	17,000,000 tons	30 million tr oz Ag; 2 billion lb combined Cu, Pb, and Zn.	1983	637

REFERENCES

145, 153, 166, 188, 203, 224, 258, 268, 284, 381, 424, 433, 471, 490, 633, 634, 635, 636, 637, 644, 645, 757, 776.

USGS quad maps	Ely, 1:250,000. Ely, 15′.
USBM sequence number	0320330112.
USGS MRDS number	W016410.
Mid number	2600576.

Comments: A 1,100 t/d (1,200-ton/d) flotation plant is being designed such that capacity can be increased to 1,800 t/d or 2,700 t/d (2,000 or 3,000 ton/d) at a later date. The first 5 yr of production are anticipated to average 100 g/t Ag, 5.5% Zn, and 1.4% Cu.

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[1] Resource is referred to as blocked.

WHITE CAPS—ANTIMONY

Alternate names: None

Commodities: Au, Sb, As, Hg

LOCATION-OWNERSHIP

County	Nye.	General location	About 56 km northeast of Tonopah.
Mining district	Manhattan.	Meridian	Mount Diablo.
Elevation	2,438 m.	Tract	Sec. 21, T 8 N, R 44 E.
Topography	Rugged.	Latitude	38°31′54″ N.
Domain	Unknown.	Longitude	117°02′57″ W.

Owner	Argus Resources, Inc., Glendale, CA (1985).

GEOLOGY

Type of ore body	Replacement.	Host formation	White Caps Limestone Member of the Gold Hill Formation.
Origin	Replacement of limestone.	Geologic age	Cambrian.
Shape of ore body	Irregular.	Rock relationships	Limestone, replaced by ore.
Ore controls	Lithology, faulting.	Size	Small.
Mineralized zone average dimensions.	Unknown.		
Mineral names	Gold, realgar, pyrite, stibnite, fluorite, cinnabar, orpiment.		

DEVELOPMENT

Current status	Inactive-past producer.	Distance to water supply	Can be developed on-site.
Type of operation	Underground.	Road requirement	None.
Year of discovery	1905.	Distance to power supply	<10 km.
Discovery method	Ore mineral in place.	Mill location	Unknown.
Initial production	1911.		
Last production	1964.		
Past production	$2.5 million Au; 45 t Sb metal (*376*).		

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

23, 191, 192, 194, 195, 276, 357, 368, 376, 814.

USGS quad maps	Tonopah, 1:250,000. Manhattan, 7.5′.
USBM sequence number	0320230120.
USGS MRDS number	M05530.

Comments: White Caps Mine is primarily a gold deposit containing appreciable amounts of antimony in the form of stibnite.

WHITE PINE—FLUORINE

Alternate names: None

Commodities: CaF_2

LOCATION-OWNERSHIP

County	Nye.
Mining district	Unorganized.
Elevation	2,438 m.
Topography	Hilly.
Domain	National forest.
Owners	Maynard and Lester Bisoni (1981).

General location	About 61 km southwest of Ely.
Meridian	Mount Diablo.
Tract	Sec. 21, T 12 N, R 58 E.
Latitude	38°52'57" N.
Longitude	115°26'55" W.

GEOLOGY

Type of ore body	Disseminated, replacement.
Origin	Hydrothermal.
Shape of ore body	Tabular.
Ore controls	Bedding, faulting.
Strike and dip of mineralized zone.	N 40° W: 30° E.
Mineralized zone average dimensions, m:	
Length	990.
Width	300.
Thickness	210.
Mineral names	Fluorite, calcite, quartz, vesuvianite, mica, diopside, orthoclase, chlorite.

Host formation	Lincoln Peak.
Geologic age	Cambrian.
Rock relationships	Phyllite, encloses ore, ore in fractures. Limestone, encloses ore, replaced by ore. Rhyolite, near ore. Quartz monzonite, near ore. Quartz diorite, near ore.
Size	Large.

DEVELOPMENT

Current status	Inactive-explored prospect.
Type of operation	Surface.
Mining method	Proposed open pit.
Year of discovery	1976.
Discovery method	Ore mineral in place.
Initial production	None.

Distance to water supply	On-site
Road requirement	<10 km.
Distance to power supply	<50 km.

PUBLISHED RESERVES-RESOURCES

No published reserve-resource information.

REFERENCES

455, 456, 545.

USGS quad maps	Lund, 1:250,000. Currant Mountain, 15'.
USBM sequence number	0320230667.

WINDFALL—GOLD

Alternate names: Eureka Windfall Mine, Western-Windfall Project
Ore bodies: Windfall, Rustler, Paroni

Commodities: Au, Ag
(Au-Ag ratio ≈5.7:1)

LOCATION-OWNERSHIP

County	Eureka.
Mining district	Eureka (Pinto).
Elevation	2,330 m.
Topography	Rugged.
Domain	Mixed; private and BLM administered.

General location	About 6.5 km south of Eureka.
Meridian	Mount Diablo.
Tract	Sec. 2, T 18 N, R 53 E.
Latitude	39°27'15" N.
Longitude	115°58'42" W.

Owner	Western Mining Services Ltd., Reno, NV (subsidiary of Western Gas, Oil and Mining, Reno, NV) (1982).
Operator	Western-Windfall Ltd., Eureka, NV (operational entity of Western Mining Services Ltd.) (1982).

GEOLOGY

Type of ore body	Disseminated, replacement.
Origin	Hydrothermal, oxidation.
Shape of ore body	Sheeted, wedge-shaped.
Ore controls	Fracturing, faulting, folding, lithology.
Age of mineralization	Late Cretaceous-Tertiary.
Mineralized zone average dimensions, m:	
Length	About 2,000.
Width	30 to 60.
Thickness	>300.
(Rustler ore body—400 m by 200 m by 300 m deep).	
Mineral names	Free gold, silver, iron oxides, arsenopyrite, kaolinite, jasperoid, quartz, calcite.

Host formations	Hamburg Dolomite. Dunderberg Shale.
Geologic ages	Mid-Cambrian. Upper Cambrian.
Rock relationships	Sanded dolomite, ore in fractures, lies under ore (Windfall ore body). Shale, ore in fractures, lies above ore. Jasperoid, contains ore (Rustler ore body). Oligocene intrusive and extrusive rhyodacite, lies near ore, lies above ore (ore bodies localize along shale-dolomite contact).
Size	Small.

DEVELOPMENT

Current status	Active-producer.
Type of operation	Surface.
Mining method	Open pit; multiple bench (3 m); about 320,000 t/a ore.
Year of discovery	1902 or 1908; rediscovered in 1974 by Idaho Mining Corp.
Discovery method	Geochemical anomaly (1974); drilling.
Initial production	1975.
Last production	1983.
Past production	About 59,000 t ore, 10 g/t Au (1908–19) *(232)*; published production of recent years is unavailable.
Annual production rate	Reported 200 kg (5,000 tr oz) Au from leaching about 320,000 t ore (1982)

Distance to water supply	6.5 km to wells.
Distance to power supply	3.2-km electric transmission line installed.
Mill location	On-site.
Mill status	Active.
Milling method	Cyanide heap leach, carbon adsorption, electrolysis, smelting.
Process rate	1,100 t/d (1,250 ton/d) (1980).
Product type	Dore bullion (60% Au, 30% Ag).

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1. Proven and indicated	3,000,000 tons	0.03 tr oz/ton Au	1975	805

REFERENCES

80, 83, 232, 365, 378, 412, 518, 520, 522, 552, 593, 692, 775, 805.

USGS quad maps	Ely, 1:250,000. Pinto Summit, 15'.
USBM sequence number	0320110142.
Mid number	2600891.

Comments: The Hamburg Dolomite is the principal host. The Windfall Mine reopened and shut down again in 1983. As a result of the permeable texture of the Windfall ore, it was not necessary to crush it prior to heap leaching. Pond irrigation (rather than sprinkler irrigation) enables year-round leaching operations. The Windfall ore body is depleted, the Rustler ore body is being mined, and the Paroni ore body is being developed.

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YERINGTON—COPPER

Alternate names: Anaconda Copper, Empire Nevada

Commodities: Cu, Mo, Ag, Au

LOCATION-OWNERSHIP

County	Lyon.
Mining district	Mason.
Elevation	1,365 m.
Topography	Rolling.
Domain	Private.
Owner[1]	Don Tibbals, Yerington, NV (1985).

General location	About 53 km southeast of Carson City.
Meridian	Mount Diablo.
Tract	Sec. 16, T 13 N, R 25 E.
Latitude	38°59'01" N.
Longitude	119°11'35" W.

GEOLOGY

Type of ore body	Disseminated, stockwork.
Origin	Hydrothermal.
Shape of ore body	Massive.
Ore controls	Igneous, fracturing.
Strike and dip of mineralized zone.	N 60° W: 05° W.
Mineralized zone average dimensions, m:	
Length	1,650.
Width	490.
Thickness	195.
Depth	60.
Mineral names	Chalcopyrite, bornite, covellite, pyrite, magnetite, chrysocolla, cuprite, tenorite, malachite, chalcocite, copper.

Host formation	Yerington Batholith.
Geologic age	Jurassic.
Rock relationships	Quartz monzonite, ore in fractures, gangue. Granodiorite, ore in fractures, gangue.
Size	Large.

DEVELOPMENT

Current status	Inactive-past producer, abandoned.
Type of operation	Surface.
Mining method	Open pit.
Year of discovery	1865.
Discovery method	Ore mineral in place.
Initial production	1953.
Last production	1978.
Past production	771,000 t Cu from 144 million t ore (*49*).

Distance to water supply	On-site.
Road requirement	None.
Distance to power supply	On-site.
Mill status	Dismantled.

PUBLISHED RESERVES-RESOURCES

Class	*Quantity*	*Grade*	*Year*	*Reference*
1..Not reported in reference	126,900,000 tons	0.343% Cu	1982	49

REFERENCES

25, 49, 126, 128, 140, 286, 295, 320, 360, 453, 467, 567, 574, 575, 666, 695, 822, 824.

USGS quad maps	Walker Lake, 1:250,000. Yerington, 15'.
USBM sequence number	0320190001.
USGS MRDS number	M030104.
Mid number	2600085.

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[1] In 1982, Don Tibbals reached an agreement to purchase the Yerington property from the Anaconda Minerals Co., Denver, CO. At that time, Tibbals planned to convert most of the 3,295 ha (8,143 acres) into an industrial park, consisting of about 50 industrial buildings, 170 homes, 20 apartments, recreational buildings, and utilities including a sewage system.

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APPENDIX A.—LIST OF ABBREVIATIONS

CHEMICAL SYMBOLS

Ag	Silver.
Al	Aluminum.
Al_2O_3	Alumina.
APT	Ammonium paratungstate.
Au	Gold.
Ba	Barium.
$BaSO_4$	Barium sulfate, barite.
Be	Beryllium.
Ca	Calcium.
CaF_2	Fluorite, fluorspar.
CaO	Calcium oxide.
Co	Cobalt.
Cu	Copper.
F	Fluorine.
Fe	Iron.
Hg	Mercury.
Li	Lithium.
LiO_2	Lithia.
Li_2CO_3	Lithium carbonate.
Mg	Magnesium.
MgO	Magnesia.
Mn	Manganese.
Mo	Molybdenum.
MoS_2	Molybdenite, molybdenum sulfide.
Ni	Nickel.
Pb	Lead.
S	Sulfur.
Sb	Antimony.
Se	Selenium.
V	Vanadium.
V_2O_5	Vanadium pentoxide.
W	Tungsten.
WO_3	Tungsten trioxide.
Zn	Zinc.

MISCELLANEOUS ABBREVIATIONS AND SYMBOLS

BLM	(U.S.) Bureau of Land Management.
CCD	Countercurrent decantation.
Insol.	Insoluble.
MRDS	Mineral Resources Data System.
ppt	Precipitation.
quad	Quadrangle.
R	Range.
Sec.	Section.
T	Township.
USBM	(U.S.) Bureau of Mines.
USGS	U.S. Geological Survey.
°	Degree.
′	Minute of arc (plane angle).
″	Second of arc (plane angle).

APPENDIX B.—COMMON CONVERSION FACTORS[1]

To convert to *kilograms* (*kg*) from—	Multiply by—
Grams	**0.001**
Troy ounces	.0311035
Pounds (avoirdupois)	.453592
Short tons	907.185
Metric tons	1,000.0

To convert to *metric tons* (*t*) from—	Multiply by—
Grams	0.000001
Pounds (avoirdupois)	.000453592
Kilograms	**.001**
Short tons	.907185

To convert to *troy ounces* (*tr oz*) from—	Multiply by—
Grams	0.0321507
Pennyweights	**.05**
Pounds (avoirdupois)	14.5833
Kilograms	32.1507
Short tons	29,166.7
Metric tons	32,150.7

To convert to *pounds* (*lb*) from—	Multiply by—
Grams	0.00220462
Troy ounces	.0685714
Kilograms	2.20462
Short tons	**2,000.0**
Metric tons	2,204.62

To convert to *short tons* (*ton*) from—	Multiply by—
Grams	0.00000110231
Pounds (avoirdupois)	**.0005**
Kilograms	.00110231
Metric tons	1.10231

To convert to *76-lb flasks* from—	Multiply by—
Grams	0.0000290082
Pounds (avoirdupois)	.0131579
Kilograms	0.0290082
Short tons	26.3158
Metric tons	29.0082

To convert to *grams per metric ton* from—	Multiply by—
Troy ounces per short ton	34.2857

To convert to *troy ounces per short ton* from—	Multiply by—
Grams per metric ton	0.0291667

To convert to *cubic meters* (m^3) from—	Multiply by—
Acre feet	1,233.6192

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[1] Except for cubic meter conversion to acre feet, conversion factors are from BuMines Statistical Standard 1-83, June 6, 1983.

Note: Boldface conversion factors are exact.

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